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A Handbook

OF

TREES, SHRUBS, AND PLANTS

SUITABLE FOR

TOWN CULTURE

IN THE

*OUTDOOR GARDEN, WINDOW GARDEN
AND GREENHOUSE*

BY

B. C. RAVENSCROFT

LONDON

GEORGE ROUTLEDGE AND SONS

BROADWAY, LUDGATE HILL

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The writer lays no claim to be considered a learned botanist, so that any shortcomings in that department should not be too severely dealt with; but he ventures to hope that the contents of these pages being, with few exceptions, the embodiment of the result of actual trial and experience, extending over a period of some years, will have a practical value superior to any amount of mere book-learning.

B. C. R.

LONDON, June 3, 1882.

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INTRODUCTION.

GARDENING is without doubt the purest and most lasting of human pleasures or amusements. For a busy city toiler, whether his work lies in the office, at the desk, or in the workshop, nothing is so restful, refreshing, interesting, and beneficial after the labours of the day as looking after a bit of garden, or even a few plants in pots or boxes. To women, too, or invalids, what a solace a few flowers are ; and to the eye of all, even of the casual passer-by, how pleasant a few well-grown plants in a window appear—what a delightful change from the grim monotony of streets and houses !

But pleasant and desirable as all must allow flowers to be, admiring them and growing or keeping them in health and beauty are two widely different things. Let no one imagine that he, or she, has merely to buy a few plants, look at them, and (of course) give them a little water occasionally, to have a constant supply of flowers, or even keep them alive and well. There can be no greater mistake than this, especially in town air. No, to be a successful gardener you must have a real, active, unquenchable, and untiring *love* for flowers, no mere liking. You must study their nature, wants, and individual peculiarities ; you must have almost inex-

haustible patience and perseverance, and besides these, you must have a considerable amount of common sense —be able to find out the why and wherefore of this or that, and act upon it. Given these, and a very small amount of money, for in these days of cheap things, especially cheap plants, a little goes a long way, and wonders may be done in the most unpromising places. Remember, *constant* care and attention is necessary, when a plant wants anything you must find out, or see its needs, for it can't *tell* you, and you must supply the need at once: often a day's, or even an hour's, neglect will undo the labour of weeks or months. But flowers are wonderfully grateful, and for all your care, if rationally bestowed, they will repay you tenfold in beauty and sweetness.

TOWN GARDENING.

PART I.

HINDRANCES TO PLANT GROWTH.

GARDENING in towns differs from gardening in the country, inasmuch as, besides the usual labour of raising your plants and keeping them in health, there are three great enemies to plant growth which have to be combated, with which the country gardener is but little troubled.

1. **Impure and Poisonous Air.**—This is the greatest enemy by far that plants have to contend with, as it is more subtle and difficult to deal with in towns than the others. It must be borne in mind that this impurity is divided into two classes,—first, actual mechanical impurity, consisting of the soot, smoke, dust, and dirt with which in various forms the air of our cities is loaded. This is much more easily dealt with than the second kind, for by covering, as far as possible, our plants with glass, and thereby preventing the continual deposit upon their leaves, &c., of these injurious particles, which would otherwise take place, and which chokes up the pores and so suffocates, and in time kills, the poor plants; also by constant washing, syringing, &c., the plants and their leaves, especially when the former precaution cannot be taken (and even when it can, as an additional advantage), we can to a great extent moderate this evil. But the second kind of impurity, the chemical, is much more difficult to deal with. The only condition under which this evil may be at all successfully dealt with is in the artificial atmosphere of a conservatory or greenhouse, and the larger the internal

area and contents of such a structure, and the greater the extent of healthy vegetable growth and foliage contained within it, also the more perfectly, consistent with the health of its inmates, the external atmosphere can be excluded, the greater will be the consequent advantage. We have found some benefit from the use of Condy's Disinfecting Fluid in the town greenhouse.

One of the greatest, if not *the* greatest enemy to plant-life in large towns is the enormous consumption of gas for lighting and other purposes. The fumes, or products of combustion, of coal-gas have a more injurious effect upon plant-life than anything else with which we are acquainted, and it will be a happy day for plants and plant-lovers when the electric light finally banishes its poisonous rival, and reigns supreme. In the meantime, let us advise all who really care for their flowers, as far as possible, to burn paraffin in their houses: it is much cheaper than, though certainly not so convenient as, gas.

2. Absence of Light.—Another great drawback to the culture of plants in towns is the gloom, comparative absence of sunshine, and general want of that clear wholesome light which is necessary to the healthy growth of all kinds of plants, and which prevails to so great an extent in large cities, especially in the winter season. This applies also to the last-mentioned evil—viz., the impurity of the air, which is much greater in the winter than the summer season, from the greater number of fires employed for household purposes, &c.; so that on these two accounts common-sense tells us that summer is the season for the town gardener, and in practice this is found to be so; his efforts to obtain a winter or even early spring display will meet with but a poor reward, as a rule. All that we can do is to keep all glass, &c., as clean as possible, especially during the dark days, and to take care that our plants get every ray of light that can be had. One great hindrance is that town gardens are often more or less surrounded by high buildings, and in such a case every precaution will fail to prevent the plants being drawn up, and to some extent weak and lanky in appearance. Hence it is advisable, wherever it is possible to do so, to have our conservatory or greenhouse constructed upon the roof of the house, or on as elevated a position as can be had; even outdoor borders may be arranged advantageously on such a space, for plants like a wide uninterrupted view, and light and air all round them, and this is sometimes the only position where they can obtain it.

3. Unwholesome Soil.—The sour, soot-permeated, unwholesome, and often altogether worthless soil that is usually found in town gardens is another drawback to the successful culture of plants, but this is by far the least formidable obstacle to success, for though we cannot bring pure air or light from more favoured localities for our pets, yet we can bring them pure wholesome soil; and our friend common-sense tells us that in order to counteract as far as possible other unfavourable conditions, we must give our plants, whether grown in pots, boxes, or beds, the very best of soil and other necessaries that we can. This will be fully treated on hereafter in a chapter on soil.

There is one other great difference between the air of a town and that of the country—viz., that in the former, from obvious causes, the air is so much drier than outside. It is scarcely necessary to enter into an explanation of this difference here. It arises from several causes, the chief of which is, that whereas in the country the surface of the ground is almost entirely covered with vegetation—trees, grass, &c.—all of which act as reservoirs, as it were, of moisture, as well as distributors, by storing up within their tissues, &c., to a great extent, the rain that falls upon them, and afterwards continually giving off this, as well as what they draw from the natural and constant moisture stored up in the soil by gentle and steady evaporation from their leaves and blades. Yet in a town there is nothing of the kind; paving-stones, bricks, and tiles do not store up any appreciable amount of moisture, and consequently cannot give off any, or at least only a little just after rain. This circumstance leads us to the conclusion that not only may syringing, watering, &c., especially in dry weather, be practised advantageously to a far greater extent than would be advisable in the country, but that this, with other dwarfing influences, renders suitable a much richer soil than is needed where these influences do not exist.

Cleanliness.—This must be steadfastly adhered to. No dirt, no disorder anywhere, but clean pots, as clean as water and scrubbing-brush can make them, both inside and out; clean crocks, clean soil (this is no anomaly), and in your greenhouse or window not only clean plants and foliage, but clean shelves and glass and floors; in fact, everything as clean as it can be. Plants hate dirt; it is poison to them; and where a man can live and be in health for fifty years or more an oak tree may die in a year or two, and all from dirt in one shape or other. Take, for instance, a potted of

rooted cuttings where a nice clean pot has been used, clean crocks carefully put in, over that a little Moss, and filled up with nice sweet soil that will scarcely dirt one's fingers. When reversed and turned out on the hand how nice it looks! how the clean white roots coil neatly and strongly among the soil and crocks! and how healthy the leaves above appear! above all, how they grow! Now take one where an unwashed pot has been used, a lot of messy soil crammed in, and the cuttings poked in anyhow, as some people do, and what is the result? Why, failure and disappointment, of course.

Manure.—It is astonishing how much this very important point in the production of good crops of either flowers or vegetables is neglected, especially by amateur gardeners. People are beginning to find out now how very important heavy manuring and deep digging are in the growing of vegetables, but many do not seem to think it necessary to give their flower-beds any nourishment. This is a great mistake; flowers want manure just as much as vegetables do, though it should be of a more delicate, or rather less coarse, description, and it must not be used in such large quantities. Take Geraniums, for instance; the old style used to be poor soil and as little water as possible; now we give them rich soil, though not too much pot room, and plenty of water and liquid manure, and look at the glorious heads of bloom obtained by this method as compared with the old. Therefore, give your flower-beds a good dressing of either leaf-mould—which is much milder and more suitable as a rule for flowering plants than rank manure; or this last, if very old and thoroughly decayed, may be used, either alone or in addition to the decayed leaves, regularly every year, and the advantage will soon be most unmistakably apparent. There are exceptions to this rule as to every other; some few plants do better in a somewhat poor soil, but they are the exception.

Vegetables, Fruit, &c.—It may as well be here stated that the gardener in town will find it not nearly so satisfactory to attempt to grow vegetables or fruit as flowers. Potatoes do no good at all. Cabbages grow to such a length of stalk, with so little on the top of it, that the only result is a derisive laugh on the part of one's neighbours instead of a succulent dish on one's table. Even Runner Beans, at least in the heart of London, drop nearly all their blossoms, though in the suburbs, or even a moderate-sized town, they are a capital crop if sown in good rich soil, and carefully

trained in a favourable position. Radishes and Spinach, particularly the strong-growing varieties, will do well in rich soil; and lettuces, well grown, will give a fair crop, but never heart well, and must be thoroughly washed before using. Dwarf Beans (French) often produce a fair crop, and these, with a little small salading grown in frames, are about the most suitable crop to attempt. The best dwarf Bean to grow anywhere is the Canadian Wonder. Mustard and Cress, Onions, &c., may be grown in frames or boxes covered with glass, for if grown in the open your salad will be so black by the time it is fit for use as to be almost uneatable. A few roots of Rhubarb, planted in a well-manured border, will yield a good gathering, especially if forced or protected by means of large boxes covered with glass, or forcing pots, &c. Vegetable Marrows will sometimes set a few fruit if well grown, and Strawberries do, with care, almost better than anything. A short chapter upon the best method of growing these will be found farther on. Tomatoes, being strong growers, will yield a crop, especially if grown under glass, but Cucumbers, &c., frequently turn yellow and drop off when 2 in. or 3 in. long. Hardly any kind of berry fruit will set. Even Solanums, grown for their berries, will never keep more than three or four on, no matter what care may be taken of them. Besides Strawberries, Grapes are almost the only fruit found to give any appreciable result, and these, unless protected by glass, are so dirty by the time they are ripe as to be scarcely eatable. Gooseberries and Currants will give better results than any other bush fruits, but blame no one if the fruit fails to set, or drops off, in a bad season. The obvious conclusion is, with the few exceptions mentioned, to leave such unsatisfactory subjects alone, and confine your efforts to the production of flowers only. Fruit-bearing is a stage beyond flowering; it is as much as the plants can do to reach this stage successfully without going any farther.

However, having determined to grow something, the ambitious amateur's first inquiry is—

What to Grow.—Strange as it may appear, there are some plants that will grow almost without care, to all appearance as well in a town as in the country; and again there are others that all the care and expense that can be bestowed upon them will fail to save from an untimely end. Between these two extremes are a vast number of subjects that will give more or less good results, according to the more or less favourable situation in which they grow, and the amount of care and attention bestowed upon them. Of

course in the suburbs of a moderate-sized town many things will grow and flourish with ordinary care which it would be of no use attempting to grow in the heart of London. Let it be understood, however, that all my remarks on town gardening, unless where an express exception is made, apply to situations in the heart of large towns, where miles of streets and houses intervene between them and the green fields in every direction.

I have always found that the most unsatisfactory class of plants to attempt to grow in such places are, with few exceptions, our common old-fashioned English flowers, such as Violets, Pansies, Roses, &c. Roses will not grow, even when protected by glass and every possible care taken of them, and especially in London; they only drag out a miserable existence for a year or two, and then inevitably perish. On the other hand, many exotics, such as Petunias, Lobelias, &c., will grow and flower almost as well as if in the country. The common Primrose and the Cowslip may, however, be taken as an exception to the above rule. These will not only grow, but also flower very satisfactorily in any town, if planted in good rich loam and a little care taken of them. To these may be added the common wild blue Hyacinth or Squill (not the Harebell), which makes a very pretty show each spring. On the whole, the plants that will give the best display out of doors are to be found among those usually employed for summer bedding, such as Geraniums, Verbenas, Calceolarias, Lobelias, &c.; though Heliotropes and some others will not do much good as a rule. Next to these may be ranked many of those known as hardy perennials and biennials, though, as most of these will be greatly debilitated, if not killed outright, by the smoke and poisonous fogs of winter, with few exceptions, the best results will be obtained from those that succeed when treated as annuals—*i.e.*, if sown early in spring, in a little heat if necessary, will make good plants and bloom freely the same year. These include Antirrhinums (Snapdragon), Hollyhocks, Canterbury Bells, Sweet Williams, Delphiniums (Larkspur), Digitalis (Fox-glove), Scabious, &c.; even Dahlias, though not usually hardy, will bloom the first season from seed. Of those perennials that cannot be treated thus, those will succeed best that die down to the ground in winter, leaving only a living root or tuber, which, being buried, is to a great extent protected thus. Next to, and indeed equal to these, stand hardy and half-hardy annuals, of which Mignonette, Stocks, Asters, Marigolds, and Phlox Drummondii are among the

most useful. Beyond these, there are many climbers and shrubs, both flowering and grown for their fine foliage, such as the Virginian Creeper, the common White Jasmine, the Ribes, Sumach, and others, as well as tall deciduous plants, Chrysanthemums, Dahlias, &c., which will do well anywhere; so that if a careful selection is made, a fine effect may be produced, nearly, or quite equal, to what can be done outside, in pure country air. All forest trees, especially the Oak, Ash, Elm, &c., cannot exist in the smoke of large towns.

However, to sum up, grow only suitable plants, of which lists will be given, and take care, also, to grow only the best and most vigorous varieties. Grow them from the very best seeds or cuttings—that is, if you grow your own—and the best, and consequently most expensive, seeds will often be found the cheapest in the end. Give your plants the very best of soil and everything else you can afford, and constant attention, with untiring care, will be sure to produce good results. The watering-pot and syringe will be your best allies. Keep them going constantly in anything like dry weather. Here it may be remarked that, as a rule, for the town gardener, seedling plants will give much better results than those raised from cuttings, as they grow and flower so much more strongly and freely. Of course when you have a good variety of any flower it is advisable to propagate and preserve it by means of cuttings, but the winter in large and smoky towns is such an ordeal, that after a few seasons anything that is not of a very robust description will have become so debilitated as to be almost worthless, at least such is my experience. Therefore grow all such plants as Petunias, Lobelias, Verbenas, and all such plants as give good results as seedlings, from good seed freshly every year. Whatever you must preserve through the winter, even such things as hardy perennials, &c., keep as far as possible under glass.

One other point. In most cases, much better results will be obtained by growing your own plants, from seed, if possible, if not, from cuttings, than by purchasing those that have been raised in a country nursery, however strong and healthy they may be; as the sudden change to such ungenial surroundings often gives such a check that they never get over it; whereas in the former case they seem to become acclimatized, as it were, and grow up quite used to it. In fact the *only* way to obtain a bed of such plants as Pansies, &c., in a town garden, is to raise a good batch of seedlings, and get them into flower as soon as possible.

There are three great divisions into which town gardening may be divided:

1st, out-door gardening—*i.e.*, beds or borders in the open air; 2nd, window gardening, or the culture of plants in boxes or pots on window-sills, in which so many are interested; and 3rd, gardening under glass, in greenhouses, frames, &c. For greater convenience and simplicity we will treat of these separately and in the order given. The treatment of plants under glass is placed last, not because it is least in importance, but because comparatively few amateur gardeners have the assistance of glass. But we would strongly recommend every one who wishes to grow fine plants and flowers, that is, if they have any place or room at all for anything of the kind, to erect a greenhouse of some sort; even a frame or two will be found a great help. Anything in this way is a wonderful advantage, as the glass keeps off such an enormous proportion of the soot, dust, &c., which would otherwise be deposited on the leaves of the plants, and greatly hinder their healthy growth by choking the pores. There are other obvious reasons why glass should be used in towns wherever possible, even if artificial heat cannot be applied. There will necessarily be some amount of repetition in treating of these three branches separately, but we will try to make each as clear as possible, and perfect in itself.

OUT-DOOR GARDENING.

A great deal depends upon the situation. The best aspect for a garden is, of course, south, or south-east or south-west; but if the plot of ground faces the north, or from being overshadowed by high buildings only gets a little sun in the morning or evening, it is of not much use to attempt the ordinary run of bedding plants, as these, at least when planted out, require to be exposed to the full blaze of the sun, or nearly so. In such a position only such things as ivy, Virginia Creeper, which will do well in almost any soil or situation, Creeping Jenny, Golden Feather, Ferns, &c., should be attempted. Most gardens of any size have, however, beds or borders facing in different directions, and the way to succeed is, not to put all kinds of things in at haphazard, as is the common practice, but to consider what aspect or circumstances will best suit each individual class of plants, and proceed accordingly. This part of the subject, however, may more properly be treated of under the heading—

Laying out Gardens.—This is a very wide field for remarks and recommendations. Situations vary, and a plan that would suit one place admirably would be totally unsuitable for another, so that no definite plan can be given. A garden laid out on paper, with little regard to the situation and circumstances seldom pleases. A favourite modern author says, “ Set to work to mark out and plan a garden on paper, and whom will your careful dispositions satisfy? What a most unsatisfactory square has even the great Bacon mapped out in his celebrated garden essay; and where he has failed, none, to my mind, has succeeded. Cowper, be it observed, does not lay you out a garden, walks here and alleys there, and beds and lawn and pond all ticketed. He wisely confines himself to the general praise of a garden, and to certain episodes, incidents, and operations connected with the management of it. And in this success may be attained, but not by planning out the whole with stereotyped precision. The reason probably is that no two gardens can be exactly or nearly alike—that is, if they be worthy to be called gardens. A thousand nameless circumstances and special accidents make this curve proper for a walk, or fix that slope as the one spot for your purple Beech, or suggest a Fernery here; there an opening in the shrubbery, and there a circling advance of the Laburnums, Lilacs, and Laurels hemming in the smooth-shaven, shadow-flecked golden-green lawn. You are struck by some arrangement in your friend’s garden; you would repeat it in your own; a short trial shows that it won’t do. And for this reason, that your garden has its own individuality, which differs from that of every other as much as does that of its owner from the idiosyncrasy of all his fellow-men.” These words, though of course on a much smaller scale, apply to the laying out of town gardens. There is, without doubt, a general sameness about the small square or oblong and flat spaces attached to most urban residences, called by courtesy gardens; and we cannot have ponds, Ferneries, shrubberies, and sloping lawns within so circumscribed a space. But even here there is room and scope for a far greater variety than would at first sight appear, or than is generally attempted. The front of one house is exposed to the full blaze of the sun, and the scorched up little square of ground looks as if nothing could ever grow in it. But get the soil into something like a fit state, by breaking up all the hard lumps, bringing the whole into a nice, fine, sweet, and open condition, and working in plenty of rich manure, especially

deep down, for the roots of the plants to feed on while the tops are exposed to the scorching heat, and the surface of the ground is quite dried up—and, if you like, plant a few trees, Plane or Lime; they will shade the windows from the glare of the sun nicely. Then till a bed or two with scarlet Geraniums and Verbenas (*Verbena montana* is a capital kind for such hot and dry situations); some London Pride, Corn Flowers, or Marigolds and Nasturtiums, will make the place look quite gay, with a little attention and a good shower from the watering-pot morning and evening. And yet the last occupant has actually made a rockery there, and tried to make Ferns, and Primroses, and Violets grow. No wonder he gave it up in despair. Then very likely he planted a Vine at the back of the house, where it is always shady, and couldn't make out why the Grapes did not ripen. Now put your sun-loving bedding plants in the front, with the Vine or a Virginia Creeper to cover the bare walls, and construct the rockery in the shadiest corner at the back, and plant ivy to cover the wall there, and your place will be a little oasis in the desert in a short while. Another place will be just the reverse of this one, and, in short, there are hundreds of different positions, all of which want treating differently, but for all of which something suitable may be found. Tastes differ, and as far as possible let each follow his own, but it is far better to carry out an arrangement that does not perhaps quite please you, if it is suitable for the place, and likely to succeed, than stick obstinately to one that can give nothing but vexation and failure. Remember also that, though in the country you can put things almost anywhere, and they will do more or less well, for instance, Ferns in the sun, Geraniums in a shady border, &c., yet here, where there are so many antagonistic influences, the only way to ensure success is to give everything the position best suited to its nature and requirements.

Lawns.—A bit of lawn should always be found room for if possible; it is astonishing what an improvement it is, and how it sets off the flowers. The light, excessively drained soil so often found in town gardens is very suitable for turf, far more so than anything like a clay or heavy loam, and we have ourselves had, in the very heart of London a lawn that would have put to shame those of many country gentlemen. There is no need for rich soil, except just on the surface; on the contrary, the subsoil is better to be light and rubbishy, and many a lawn has been greatly improved by paring off the turf pretty thickly, removing some of the

soil, and replacing it by 2 or 3 in. of ashes. Do not lay down Grass sods, unless you have some very good turf ready at hand; it is expensive and unsatisfactory. Dig the ground over, level it, put about 2 in. of fine, light, rich soil (sifted if possible, and the siftings put underneath), and sow a mixture of fine lawn Grass seeds, purchased from a good firm, such as Carter's, Sutton's, or any well known dealer, in April or September, preferably the former. Roll and cut regularly, but not with a machine the first few times; use a sharp scythe. Soak the lawn with water on the evenings of hot summer days occasionally, and give a dressing of fine soil, guano, and a little fresh Grass seed every spring. In this way a good turf may be had in six or eight weeks from the time of sowing, and you will have a velvety, weedless lawn, a thing of beauty, always before your eyes. A few beds cut out of the turf look nice if filled with bright flowers in summer; and if you can manage it, a fountain, with a basin as large as possible, and a few gold fish, is very pretty and entertaining. A few young trees carefully planted in suitable positions are effective, but remember that no flowering plants will do any good very near to these, and that they greatly exhaust the soil. Of course these things cannot be found room for in many places, but we are only offering suggestions, and you must do the best you can.

Arrangement.—Do not, as we have cautioned before, place a rockery at the foot of a sunny wall, and plant Geraniums and Verbenas in a shady place, but make your rockery in the shadiest, dampest corner you can find, set all Geraniums, Lobelias, Verbenas, Phloxes, Asters, &c., in the open borders or beds, where they will get every ray of sun and all the air, and on your hot border, under the south wall, sow major Convolvulus, Tropaeolums, Nasturtiums, &c., to grow up and hide the bare ugliness of the wall until your Jasmines or Vines have grown; and have rows or patches of either sun-loving bedding plants, or if the soil is very dry and poor, and you cannot replace it with better, grow Sunflowers, Marvel of Peru (this is a splendid plant for such situations), Marigolds, London Pride, Evening Primroses (*Enothera*), Stonecrop, and, if the air is not very bad, Sedums, Mesembryanthemums, and Portulacas will do. Aspidistra *lurida* is a capital plant for such a hot, dry spot. There may be other beds or borders facing more or less east or west which get a little sun morning or evening, or both; in these almost anything will grow, but the most suitable for those where shade-

predominates are Auriculas, Polyanthus, Primroses, Pansies, and Violets (where these will grow), Fuchsias, &c. Hollyhocks also like shade, but Dahlias should have full exposure to the sun. For covering sunny walls plant Vines and Fig trees (these do admirably in any town, and their large and handsome leaves are very effective), and for shady ones use Ivy and Virginian Creeper.

Shrubs break the monotony of lawn and flower beds admirably; and by far the best of flowering shrubs is the Ribes, or flowering Currant. This grows freely anywhere, and though our cold springs often cut off its blossoms just when they are opening, still it looks fresh and green all through the summer, and the pretty pink buds always appear, and occasionally get a chance to come to perfection. The next best is the Lilac, though this does not often bloom at all freely.

Stands of Flowers out of doors are not successful as a rule, as, from the dry harsh air or some other cause, plants in pots out of doors do not do well, so that the only way to manage anything of this sort is to have ornamental boxes or baskets, elevated on rustic posts to a height of 2 ft. or 3 ft., and filled with rich earth. In this almost any of the plants mentioned as suitable will grow; Geraniums, both zonal and ivy-leaved, Petunias, Fuchsias, Lobelias, &c., are about the best for this purpose.

Cats to anything just mentioned are fearful enemies, and as they abound in all town gardens, and are especially fond of such elevated positions, regarding them as a kind of vantage ground or castle in their nocturnal combats; so that unless you can effectually exclude them from the garden, you are as likely as not to find your beautiful flower-stand a melancholy wreck some fine morning. These horrible cats are the bane of town and suburban gardens, as is only too well known; they destroy anything, and sometimes everything, in the most complete and unexpected manner, and are most difficult to banish or exterminate; as one of our comic papers so well illustrated some time ago. After a considerable experience of the feline race, we have come to the conclusion that town cats are of quite a different race to their country cousins, and, indeed, partake largely of the nature of Diabolus, or the Evil One; we think that any one who has often heard the fearful howls in which they sometimes indulge about midnight will agree with us. We used to trace out their regular tracks, and, finding they went up and down the stems of

three or four small trees to get to the top of a very high fence, we nailed bands of sheet zinc about 18 in. wide round the stems, and set a number of very sharp steel hooks, like very large fish-hooks, pointing both upwards and downwards, to stop them. This our precautions succeeded in doing pretty effectually ; only one or two of the most agile could surmount these obstacles, and our garden was left almost in peace. Where there is a level wall round the whole or part of the garden, the best way is to arrange a width of wire netting, about 18 in. wide, stretched on light iron or wooden rods, inclining inwards at an angle of about 45°, along the top of the wall, or even a good width of the same set upright along the top of the wall, but with no firm rod or rail along the top edge on which the cats might get a footing. Cats are very fond of eating and rolling on the *Nemophila*, for which reason, though it grows vigorously, we have excluded it from our list of suitable plants, as we have found it impossible to keep them away from it, and they completely destroy it.

Worms, Slugs, and other vermin are often a great plague ; the former especially are often so abundant that many young plants or seedlings are thrown out, and sometimes quite destroyed by them. In this case, when digging over the beds, every worm that can be seen should be picked out and thrown into a bucket of lime, the soil should be well dressed with lime at the same time ; and it is a good plan, on moist summer nights, about ten o'clock, when they will have come out to feed, to go round with a little fresh slaked lime in a porous bag, and give a good dusting over the beds ; this will prove fatal to many, both of worms and slugs. These last are easily destroyed by means of a little salt or a spot of ammonia ; if any are to be found, a damp evening is the time to look for them. Wireworms are sometimes troublesome ; there is no remedy for these but picking them out of the soil by hand : they are attracted by slices of carrot placed just below the surface of the ground. There is also a dark brown legless grub that commits sad havoc among newly-planted things ; they will eat the stem of a geranium through in a single night ; these must be searched for after dark by means of a lantern. Earwigs, often very destructive to dahlias, must be trapped with pieces of straw or reed, in which they hide during the day. Woodlice are sometimes troublesome, but are easily entrapped by a piece of fresh boiled potato placed in the bottom of a pot, and filled up with dry hay or moss ; of course when caught they must be destroyed.

Rockeries.—A rockery is easily constructed, and should find a place in every garden if there is a suitable position for it. London Pride, Creeping Jenny, and Stonecrop will grow almost anywhere, and some of the hardiest and most robust-growing Ferns may also be tried if the situation is at all favourable, but these are apt to get very scrubby and stunted in dusty and smoky corners. If you want good Ferns, and do not mind the expense, cover a corner over with glass, so as to form a miniature greenhouse or high frame. In such a place nearly all the hardy British Ferns will grow luxuriantly; they require but little air, and should have plenty of water when in growth. For such a glass case or Fernery the best are *Athyrium Filix-fœmina* (the Lady Fern), *Polystichum angulare*, and *aculeatum*, *Polypodium vulgare* and perhaps *P. phegopteris* and *dryopteris*, but these two last would require special soil and careful cultivation; in fact, all Ferns should have good fresh soil to grow in, as they have a great objection to spent or overworked material. The male Fern (*Lastrea Filix mas*) is apt to grow too large for such a case, unless this is of a good size. It does well for a rockery out of doors. *Lastrea dilatata*, the Hart's-tongue (*Scolopendrium*), and the *Ceterach officinarum* do well; but the more delicate Ferns, such as the Hard Fern (*Blechnum*), and the Moonworts, Adder's-tongue, the Bladder Ferns, the Spleenworts (with the exception of *Asplenium Adiantum nigrum* and *A. rutamuraria*), require purer air than they can get in a town. The best soil for Ferns is a light, sandy, peaty loam, with plenty of fibre in it, such as the soil from a common, or it may be made artificially by mixing about equal parts of good loam, such as is used by florists, and peat, with a little leaf-mould and plenty of silver sand. The place where they grow should be well drained, so that plenty of water may be applied to them when in growth. Solomon's Seal, and the Creeping Jenny, or Moneywort, also London Pride, will do well with Ferns in a shady situation.

Flowering Plants.—Returning to flowering plants, we think that the bedding-out system is overdone in the present day. It is very expensive, and the beds are only in beauty for a little more than three months, or four at the outside. If done at all it must be done well, only well grown and hardened plants of suitable kinds be employed, and all of each variety must be nearly identical in height, shape, habit, &c. So we advise, do not have your garden all straight lines and regular curves of exactly similar plants, but though

these are very well, and indeed desirable to a moderate extent, vary their mathematical precision by a mixed border or two and a few beds for specially favourite flowers; for bear in mind that plants never do so well as when they have a specially prepared bed all to themselves. This should be, of course, made in the most suitable position as to sun, shade, &c., that can be had, and if the bed is formed and filled with just the kind of soil in which the plants most delight, far better results will be given than where a number of different families are mixed together, and the soil, &c., has to be the best mean or average that you can strike amongst the requirements of all.

Designs for Flower Beds.—Regarding designs for flower beds, any one possessing a fairly correct eye and average amount of taste can design and cut out suitable shapes. We always merely measure and peg out the principal points, corners, &c., of the beds on the turf, take a sharp spade and cut the design out straight away without any bother of plans or patterns, and no assistance but a line for straight edges, perhaps. Diamonds, circles, ovals, crescents, and such simple shapes we consider far more suitable, especially where room is limited, than more intricate designs, though such as well proportioned stars, Greek crosses, &c., are very effective under certain circumstances. A visit to Battersea Park, or the Crystal Palace will give one a better idea of what may be done in this way than almost any amount of description.

Contrasting Colours.—As to contrasting the different colours in the beds, let every one follow his taste, as what pleases one is sometimes almost offensive to the eye of another; almost any reasonable combination, always aiming at obtaining as effective a contrast of one colour with another, will look well if well carried out. This is the one great secret of successful carpet bedding. The beds must have been well cut out—*i.e.*, no crooked lines or irregular curves allowed—and in the planting all the “stuff” must be, as remarked above, as even as possible; and have all lines, &c., as carefully drawn and filled in as you can; in fact, all in this respect should be perfect. In Nature colours harmonize far better than they do in art; as, for instance, yellow Calceolarias look very well against scarlet Geraniums in a border, and yet yellow and red contrasted in a picture are anything but pleasing. Of course two different shades of any colour must not be put together, unless where a regular gradation is employed, as crimson, scarlet, pink,

blush, and white, in Geraniums or other plants, which sometimes look very well. Blue and red, and especially blue and purple or red and purple, are shocking. Some of the best contrasts we know are—red next white, such as a ring of scarlet Geraniums round a large plant of *Cineraria maritima*, or *Centaurea candidissima*, or *vice versa*; blue and white, such as *Lobelia* next a row of white Verbenas or Petunias, or blue and white Verbenas contiguous; *Amarantus mel. ruber* looks well next a white-leaved *Centaurea* or *Cineraria*, and one of the prettiest is a row of white-leaved *Geranium*, as *Flower of Spring*, next a row of dark purple *Pansy*, only neither of these, the *Pansy* especially, do well in towns. Except in the case of carpet bedding proper, the plants should be arranged according to height, so as to slope from the centre downwards towards the sides. Something tall for the centre, a *Canna* or two, a group of striped Maize, or an old and large plant of *Cineraria maritima*, does well; then the others should be graduated in height as well as contrasted in colour. It is a great pity that the variegated-leaved *Geraniums* do not succeed in towns, they are so useful. But there are plenty of other things. One good design is, a purple-leaved *Canna* in the centre, then a ring of *Cineraria maritima* or *candidissima*, then scarlet *Geraniums*, then a ring of *Calceolarias* (yellow), and an edge of *Lobelia*, or, if there is room, get something else in between the last two, preferably white; or a large plant of *Cineraria candidissima*, or a clump of striped Maize for the centre, outside that scarlet *Geraniums*, then white *Petunias*, or white *Phlox Drummondii*, and an edge of *Lobelia*, or if the bed is large have a ring of *Amarantus mel. ruber* outside the white, and then *Golden Feather* for the edge.

A most effective bed may be formed by making use of a few plants each of a number of different things, not putting them in higgledy-piggledy anyhow, nor yet setting them out in the correct lines and curves usually seen, but arranging them with some amount of regularity, and with great care, according to their individual height and colours. Thus, take two or three *Cannas*, tall *Amarantus* (*mel. ruber giganteus*), *Tobacco* plants or tall *Fuchsias*, a few scarlet *Geraniums*, a few white ditto, or any colour almost; a few *Cinerarias*, *Centaureas*, yellow *Calceolarias*, or *Balsams*, in fact anything you may have at hand, with a little *Lobelia* or *Echeveria* for an edging; group them carefully together in a good-sized bed, being very careful to graduate the heights of the plants; and when they are well in growth, if well done,

you will have a bed that cannot be surpassed—a variety of leaf tints as a groundwork, with a bit of scarlet peeping up here and there among the light colours, white blossoms showing up against the dark, and graceful drooping Fuchsia-blooms toning down the stiffness of the other plants, and affording a harmonious whole.

It is of no use attempting to get such things as Coleus, Alternantheras, Iresines, &c., to grow in the smoky air of a town, though Ageratums may be made to do fairly well. And what is known as "spring bedding," lovely as it is, must not be tried either, or if it is, failure is sure to result; in short, all such things as Pansies, Violas, Alyssum, Myosotis (Forget-me-not), &c., lovely as they are, will not do any good, and it is no use attempting them.

In fine, plant your garden as thickly as you can, for some of the things are sure to fail in some way; if one thing does not succeed, try another. Plant plenty of Vines, Virginian Creeper, Ivy, and Jasmine to cover all bare walls, and put a plant of some sort in wherever it is likely to do well.

Soil.—This is often found to be very unsuitable for the healthy growth of plants. Either it is, from long neglect, want of manure, overdraining, &c., wretchedly poor, dusty and dry, and often consists more of rubbish, broken tiles, and slates, and such-like, than of anything worth the name of soil; or in damp and low localities it is often the very opposite of this—heavy, black, sticky, sodden, and utterly unwholesome. This last is far worse than the first, and can hardly be brought into a wholesome state by any means; perhaps the best way would be to burn it all if it cannot be altogether removed. In laying out a garden in town where either of these conditions are approached, or indeed in any case, by far the best thing to do is, after having settled on the plan to be carried out, to remove all the soil from the beds to a depth of 2 ft. or 3 ft., have it taken right away, and after having made the bottom smooth and hard, put 6 in. or 8 in. of broken bricks, ballast, or good rubble of any kind for drainage; on that a layer of turf sods turned upside down, and then fill up the beds with good fresh soil from the country, varying slightly in its nature according to the class of plants desired to be grown. Good mellow fibrous loam, enriched with a moderate quantity of well-rotted manure of some kind, and if at all stiff, lightened with silver or river sand, is about the best stuff for general purposes, but the most suitable soil for each class of plant will be given in the articles on each farther on.

Turfy loam, suitable for this purpose, can be purchased in London for about 10s. per cartload. But where this cannot be done (and it is certainly expensive), and if the soil is not utterly useless, a great deal may be done to improve it. Where it is too light and rubbishy, the beds should be dug out nearly 3 ft. deep, and at that depth a stratum of heavier, moister mould is often to be met with. If so, set it by itself, reserving only a little of the best of it to be brought to the top, as, having been shut out from the action of the sun and air for so long, it is not at all in a suitable state for plants to grow in, however good it may be in itself; then, if drainage is deficient, put 6 in. or 8 in. of rubble in the bottom, and over that the turf sods, as before mentioned—that is, if they can be had; if not, littery manure will do. Above that put the heavier portion of the soil, mixed with manure, and for the top 12 in. or 15 in.; use the ordinary soil of the garden, roughly sifted, all rubbish removed, and mixed with plenty of rotten manure, and, if possible, a good proportion of good fresh maiden loam on the top, or worked in near the surface. Where the soil is too loose and porous, if it cannot be removed a great deal may be done by finely sifting the upper portion, say 6 in. or even 1 ft. in depth, adding decayed manure preferably to leaf-mould in this case, and some very fine loam. If, on the other hand, it is too close and retentive, then frequent working will be beneficial; and burning a good proportion of it will also do much good; here the addition of leaf-soil or cocoa-nut fibre refuse, wood ashes and coarse sand, to keep it open, with additional drainage, would be advisable, and indeed necessary, to bring it into a fit state for the growth of plants. Leaf-mould (thoroughly decayed leaves) is very useful, and for most flowers is preferable to a quantity of manure, especially if this is not very old and rotten. Beds made as described will last for many years, and afford the best possible chance of success to such plants as Geraniums, Fuchsias, Petunias, &c., as well as to all kinds of annuals, though there are some plants, as Primroses, Violets, Pansies, and Hollyhocks, that prefer a closer and more retentive soil than such a plan as this would give. If it were desired to grow such as these, it would be advisable, unless the ground were naturally insufficiently drained, to leave out the drainage, and merely "trench" and manure the soil to a good depth.

Manure.—Where one has a garden in town there is no excuse for practising economy in the matter of manure on the ground of its expense. In London good stable manure

can be had (fresh) for about 1s. per cartload, and can, indeed, often be obtained merely by bringing it away. Spent or used Hops can also be had for nothing, or next to nothing, at most breweries in town, and nothing can be better in the garden than these; their uses are almost countless. When fresh, they make of themselves, and with but little turning to sweeten, a gentle and useful hotbed. In this they are much superior to stable manure; every gardener knows what a nuisance the labour and delay of the frequent turnings necessary to bring manure into a sweet and useful condition is, whereas Hops require little or none of this trouble, but may be put together almost immediately, and are, in addition, never so rank and dangerous as the other. When rotted they are equal, and for some things, such as vegetables, superior to manure, when dug into the ground. When a few months old, and the fermentation is well over, a handful put over the drainage is the best possible thing in potting nearly all kinds of plants, excepting, of course, all hard-wooded subjects, for which only clean Moss should be used. When pretty well rotted, too, Hops may be used with great success for filling boxes in which to prick out Pyrethrum (Golden Feather), and other similar plants. Little or no soil is needed, except just a surfacing for small things, as Lobelias, and it is astonishing what a free, rapid, and healthy growth such plants make in this material. We always use it largely in the shallow boxes used for pricking out nearly all seedling plants, only putting 1 in. or so of soil on the top. For plunging pots in frames, greenhouses, or out of doors, either when it is in a heating state or afterwards, nothing surpasses it; and when very old and decayed, it is good as part of the compost for large pots or boxes, where lightness of staple is required.

Tan can also be almost always easily and cheaply obtained in London and most large towns, and after a long experience we have found that nothing makes such a good, lasting, and useful hotbed for raising seeds, striking cuttings, &c., as fresh tan mixed with a smaller or greater proportion of stable manure. In the early spring, when a good heat is wanted, use about equal parts of the tan and manure, either mixed or in layers, preferring the former, and covering with 6 in. or 8 in. of fresh clean tan; it is so clean, and sweet, and pleasant to plunge the pots in, and no earth is needed. As the weather gets warmer less and less manure is needed, and in summer only a very small proportion, or none at all, is required. The superiority of tan over all other heating material.

is, that it is drier and more open in character, and never gets into that nasty sodden and caked condition stable manure is apt to do. It does not give off nearly so much steam as manure, thereby giving a drier atmosphere inside the frame; and especially for early work any gardener knows what an advantage that is, remembering his sad experiences of costly and carefully-reared seedlings all damped off in a single night from too much steam. What little steam there is from tan is not rank, but sweet almost from the first, so that plants or seed-pans may be placed in the frame far sooner than when manure is used. This leads us to remark that town gardeners have a by-no-means-to-be-despised advantage—viz., that the air being so much drier than in the country, damping off is not nearly such a serious difficulty. When living in the heart of London we hardly knew what damping meant. Frames were shut up close every night during the spring and no harm ensued, but on removing to the country again it took a long time to get accustomed to the altered circumstances, and many a fine pot or pan of seedlings were lost.

Artificial manures are much used by town gardeners, as being so much more cleanly and convenient than common stable manure. But with the exception of genuine guano, and Clay's and Standen's manures, these are of very little good, in our experience, and, after all, decayed stable dung is better than anything else.

Potting Soil.—The various kinds of soil should be kept in bins, if possible, or in heaps, and they must be well covered with some waterproof material, and should stand on a dry bottom, impervious to worms: this keeps the soil dry in wet weather and moist in dry weather. A good supply of nice fibrous yellow loam is of great importance, and a heap of a commoner description for ordinary purposes, well decayed leaf-mould, dittò manure, peat, and silver sand should all have a place. All should be kept separate, at least where a variety of plants is grown, as nearly everything needs a slightly different compost in which to do its best. It is well, however, to have a good heap of ordinary potting mould ready mixed. This should consist of about two-thirds good sound turfey loam, and the other third of well decayed manure, with a little leaf-mould and silver sand, enough to insure porosity. If the loam is sandy, use less sand; if stiff, use more; and if it is poor, add a little more manure. This soil will be suitable for Geraniums, Fuchsias, Calceolarias, and most ordinary pot plants. For young struck plants or seedlings, when putting them into small pots use (as a rule)

about two parts leaf-mould, one of loam, one or two parts of sand, and no manure. This will do for young Fuchsias, Verbenas, Primulas, Cinerarias, and Balsams; also, with more sand, for striking cuttings of all soft-wooded plants. For sowing seeds, especially fine ones, as Lobelias, Primulas, Petunias, &c., use fine leaf-mould and sand in equal parts, the finest on the top.

Potting.—Where much potting, &c., has to be done, all should be performed systematically and orderly, or a great waste of time and money will result. Unless where there is absolutely no other place in which to do it, potting should never be done in a greenhouse, neither should any heaps of soil or anything of the kind be kept there. In a greenhouse cleanliness should reign paramount; no empty, or at least dirty, pots or empty boxes should be seen. Wherever practicable, a proper potting shed should be erected, with bins for soil and manures, sand, &c.; such a place is extremely useful in many ways, especially if it can be warmed in winter a little in some way; it can then be used for storing the dry roots of Dahlias, Fuchsias, and other things, and the soil kept in such a place is always warm enough for use. Where the luxury of a potting shed cannot be had, have a bench fixed in some convenient corner of the yard or other suitable place, under cover if possible, as a sudden shower often brings a batch of potting to an untimely end.

RAISING PLANTS FROM SEED.

In the first place, as we have before urged, always buy the very best seeds, and get them from a well-known house or dealer. Cheap seeds generally turn out to be very dear. Also, when you buy plants or cuttings, get the best named kinds if you can, and pay a good price to a good man or house for a good thing. There is no need, as a rule, to buy a quantity, unless you want a great display at once, and can afford to pay for it. The best way is to get one or two plants of a good variety, and propagate from them yourself; this is much better than buying a lot of cheap rubbish. There is nothing over which an inexperienced person is so likely to be taken in as plants, unless you go to a really respectable place that has a reputation to keep up. Get your seeds in good time, and do not have it all hurry and careless work at the last. Remember that though spring does not come so early in town as country, yet things take longer to grow to a good size and get strong.

Time to sow Garden Seeds.—Hardy annuals out of doors, end of March or April, and, if a succession is required, at intervals up to the middle of June. Half hardy annuals, end of April or May out of doors. Greenhouse seeds for winter blooming (*Primulas, &c.*), in March under glass. Greenhouse or garden annuals, half hardy or tender, from April 1 to the end of May. It requires a considerable amount of care and experience to get things down at the proper time. Of course it does not do to be late, or the summer is half over before the plants come into bloom; but on the other hand one cannot start as early as is possible in the country; as no matter how well hardened, it is little use putting anything out of doors before May, and things soon get spoiled if they attain too great a size before they can be planted out.

Soil.—For seed sowing out of doors, the soil should be rich and fine on the surface. Most things (annuals, &c.) are sown where they are to grow, and as such are rapid growers, the soil beneath can scarcely be too deep or rich. It should have been recently dug two or three spades deep, working in a quantity of rich, rotten manure especially deep down, and should not be trodden down or made hard, but just left for a few weeks to settle. Of course every one knows that all digging and working should be done when the ground is dry; during frosty weather is the best. If in a border where there are shrubs or other things, and the ground has not, from this or other cause, been trenched previously, dig in some manure as deep as you can in the patches where the seeds are to go a few days beforehand. If not well settled, pat it down gently with the back of the spade, and rake the surface fine and level, picking out all stones, clods, or lumps, and giving a good watering if very dry. Have a basketful of rather fine sandy soil, such as the refuse from the potting bench, in a nice dry state, and a little fresh leaf-mould mixed with it if at all poor or spent. This should, however, not be too fine, or it is apt to become pasty when wet. Spread a little of this over the patch, and pat down gently with the back of the trowel.

Sowing and Thinning.—Sow the seed not too thickly, say six or eight seeds of large things, or twenty or thirty or more of small ones, and cover again with a sprinkling of the fine soil, but do not bury deeply, especially small seeds. If the weather keeps very dry, water gently with a fine-rosed pot to assist germination. When the seedlings appear thin them out if too thick, as by this means the rest grow stronger and flower finer. The thinnings of some may be transplanted if

desired, as *Tropæolums*, &c., but *Linums*, *Eschscholtzias*, *Mignonette*, and some others do not like or cannot bear being moved, in fact it is advisable to sow as much as possible where the things are to flower, and so dispense with transplanting as far as possible, in the town garden. It is astonishing what a splendid display annuals will make if they are well grown, that is, in a deeply stirred, light, and rich soil, into which they can root readily, deeply, and strongly, and if they are properly looked after, weeded, thinned, and watered, when the weather is dry.

Seed Beds.—Many annuals, especially those that are not quite hardy, also perennials and biennials are sown out of doors in what are termed "nursery beds." These may be made in any warm, airy, and light corner. They are better to be somewhat raised above the general ground level, and if a framework can be arranged over them and round, so as to protect them from heavy rains and cutting winds, they will be more successful. Have plenty of broken bricks for drainage at the bottom, or if the seeds are tender and want a little heat, and if you have no frame, it is well to make a heap of manure or spent hops, and put the soil 3 in. or 4 in. deep upon that. If there is no fermenting material beneath, however, it will be better to have a greater depth than this, say 4 in. or 6 in. of rough and rich soil over the drainage, and 3 in. or 4 in. of nice fine sifted soil on the top, about equal parts of loam, manure, leaf-mould, and sand, or rather less of the latter, is about the best; this will do just as it is for pricking out young plants, but if for sowing seeds, have about 1 in. of fine, light, sandy soil sifted, such as leaf-mould and sand, on the surface. On such a bed as this, with a gentle bottom-heat, all such things as Stocks, Asters, Phloxes, Indian Pinks, &c., will come up easily, but they would be better under glass. These nursery beds, without the bottom heat, will do well for planting out Stocks, Asters, and many other things to strengthen from the seed-pans say about the first week in May. From here they are planted out into the borders about the end of the month.

Sowing under Glass.—Although it is much better to sow all but hardy annuals in frames, &c., yet many gardeners even in the country, where not nearly such care is requisite, are far too fond of coddling things and forcing them on in heat. *Mimulus*, for instance, one is nearly always told to grow in heat; now these pretty little plants are all but hardy, and the seed should be sown either in autumn (September), and pricked off into store pots or boxes, and

kept in the greenhouse till spring, or sown in a moderately warm greenhouse or frame (45° to 50° is quite enough) in January or February, be pricked out into a cold frame at the end of March or early in April, and by this means you will have such plants and flowers as no grower in heat can produce. Lobelias should be treated exactly the same, and not be left till April, and then have to be pushed on fast, with the result of weak and lanky plants and poor flowers. Phlox Drummondi, too, and Indian and Chinese Pinks, Asters, Zinnias, with many others, are far better raised in only a gentle heat (60° is plenty), or even none at all, than run up and spoiled in a cucumber or other hot frame, as is so often done. Calceolarias (herbaceous) and Cinerarias, too, should never be raised in heat, as many direct; in fact, those plants should never have more heat at any time than just enough to keep frost away, excepting, of course, where Cinerarias are wanted to bloom in winter.

In sowing seeds, especially in early spring, always use plenty of drainage (broken crocks or bricks) in your pots or boxes, or you will find your little plants "go off" at the surface of the soil almost as soon as they are up. When using pots we fill them nearly half full, and for boxes from 1 in. to $1\frac{1}{2}$ in. is enough, if there are plenty of holes bored in the bottom as well. Over the drainage put a thin layer of spent hops, moss, or fibrous matter of some kind to prevent the soil from washing down and clogging the drainage. Then put about 1 in. or $1\frac{1}{2}$ in. of soil, not sifted, and if the seeds are small, another thin layer of very fine sifted soil above that, so that the whole may reach up to within $\frac{3}{4}$ in. or 1 in. of the top of the pot or box. We use boxes about 3 in. deep inside, though they may be a little more if preferred, and any size up to 8 in. or 9 in. wide, and 16 in. or 18 in. long is suitable.

Watering Seeds.—Watering at first is a most delicate and important point. What is to be aimed at is to have the soil just moist enough not to require any watering till the seeds are well up, as it is very undesirable to do this, and yet it must not be anything like wet, or many seeds are apt to rot and never come up. The best plan is to use the soil almost dry, or only barely moist, but not dust dry; put in the drainage and about half the depth of soil required, press it down firmly, and give it a good watering; if it is in a pot soak it half-way up in water, then fill in the rest of the soil, pressing the upper portion only slightly. Make the surface even and level; use no more water, but sow the seed at once,

and cover with only a dusting of dry soil. Place a square of glass over the pot or box, and the job is done. By this means you get enough moisture in the soil to last for days, without the surface being wet; the moisture is sure to rise quite sufficiently, and the water being down below induces the seeds to send down roots to find it. You get also a firm bottom, which holds moisture, and is of great importance, and a free, light, uncaked surface, in which the seeds will rapidly germinate, and into which the first tender rootlets can readily penetrate. As soon as ever the seeds are up tilt the glass a little on one side, or remove it altogether for an hour morning and evening. Give more and more air as they advance, and remove the glass altogether as soon as they can bear it. Also bear in mind that damping off occurs as often from too much dryness at the root as from excessive moisture overhead. When you see a pot or box of seedlings beginning to go off, examine the soil, and if dry give a thorough soaking, not a mere sprinkling. It has often been said before, but cannot be repeated too often, and applies especially here: never water plants (particularly tender seedlings) in driplets, whether they want it or not, but wait till the soil is dry, though not necessarily till the plants flag, and then give a full supply, enough to reach every fibre of the roots; after that wait till wanted again. When pots are very dry, and particularly in the case of pots or pans of very small seedlings, such as Lobelias, Calceolarias, or Tuberous Begonias, only just come up, it is better not to water from the top, as the water will often run away without wetting the soil, but plunge the pot or pan in water up to about half an inch or an inch below the level of the soil, and let it stay there till the soil is thoroughly moistened. In this way the soil gets well watered, as well as the roots, while the stems and leaves are kept dry, which is just what is wanted. In watering things from a hotbed in any way use water of about the temperature of the frame, a few degrees over rather than under. We always use water with the chill taken off for delicate young things, even from cold quarters, for fear of checks.

For nearly all seeds, a sheet of clean glass placed over the pot or box after sowing is a great help, as it prevents evaporation and creates that close, moist atmosphere inside the box so favourable for germination. If the seeds are such as require heat, place in a hotbed or warm house of the requisite temperature, but be sure and not use more heat than is really necessary; 70° or 75° at the outside is enough for

anything, except perhaps such things as Cannas and a few others, but for most things, even Begonias, Gloxinias, &c., we find that from 65° to 70° suits them much better than a higher temperature. More heat than is necessary only brings the plants up weak and sickly, so that many perish in hardening off. Petunias, Lobelias, Balsams, and all half-hardy or tender things of like nature only need from 60° to 65°, or even 5° less rather than more, in which to germinate; even the temperature of a greenhouse is sufficient, though the seeds are slow in coming up. Beware of keeping the sheet of glass on the box too long, or of coddling or keeping too close in any way, or the seedlings soon get so delicate and drawn, that many of them will damp off.

After sowing, seeds may be put in a dark place, or any odd corner, so that the temperature is right and there is no mildew or fustiness about; in fact, seeds germinate better in the dark; but as soon as ever they are up they must be brought close to the glass, the closer the better, so that they are not near enough to be touched by a frost or low temperature outside; so keep 3 in. or 4 in. away for fear of injury. It is always safer to cover up all frames, &c., that contain such tender things with mats, &c., on all frosty or cold nights, especially in the spring; this plan saves heat and has many advantages, but do not cover up till it gets dark, and be up and remove again betimes in the morning as soon as it is light, as young things want all the light they can get, especially when in a warm temperature.

Regarding the soil most suitable for seed sowing in pots, it must always be fine, light, and moderately rich, though it should vary considerably for different subjects. Leaf-mould is the most useful of all soils for this purpose, as its nature induces seeds to germinate in it far more readily than in any other kind of soil. Plenty of sand should also always be used, especially near the surface; it insures porosity and prevents damping. For most seeds, especially fine or delicate ones, leaf-mould and sand in nearly equal parts, rather less of the latter, is best. The top $\frac{1}{2}$ in. or $\frac{1}{4}$ in. should be finely sifted for small seeds, but for Verbenas, Balsams, and other large seeds do no sift at all; only pick out all lumps, sticks, &c. Use the soil rougher and richer below, and finer and sandier on the surface. A little loam may be used in the compost, especially below the surface for strong growing things, as Stocks, Asters, Pansies, Holly-hocks, and others; but as it is apt to make the soil cake, leave it out for delicate growers.

Striking Cuttings.—Pots are better than boxes for striking cuttings in as a rule, except where a large quantity have to be raised; then use a properly prepared frame, without pots or boxes, the soil being filled in to form a bed. Three-inch pots, or what are known as large 60's, are the most useful size; fill them nearly half full of drainage; on that place a few hops or a little moss, and fill up to the rim with nice sandy soil, not sifted. When filled, stand nearly up to the rim in water till soaked through; then set aside for an hour or two to drain. Make good large holes with a stick for the cuttings, pour a little dry silver sand into each hole for the base of the cutting to rest on, put in your cuttings, and fill up and around with silver sand, pressing them in pretty firmly. Then give a light sprinkle to settle the cuttings in the soil, stand aside till the leaves are dry, and then place in a frame or house, with or without heat as required. Keep them close, only admitting a little air for an hour in the morning or evening to dry the leaves and prevent damping until rooted, when gradually accustomed to plenty of air, and when well rooted, pot off singly. Most cuttings, except Geraniums, must be shaded from hot sun until roots are formed, and in some cases after. Three or four Geranium cuttings in a 3-in. pot are enough; these like a rather loamy soil to root in. For Fuchsias use only leaf-mould and sand, and put five or six or even eight cuttings in a pot. Petunias, Verbenas, &c., like equal parts of loam, leaf-mould, and sand. It is as well to let cuttings have a little sun morning and evening to raise the temperature of the frame, but shade as soon as the sun gets hot. They must also be kept moist, but not wet, and as close as possible, so that damping does not occur, till rooted. It is astonishing what numbers of things can be rooted in a simple box of any convenient size and 9 in. to 1 ft. in depth, half filled with drainage and soil, and covered over with a sheet or sheets of glass. During May, June, July, and August, Fuchsias, Geraniums, Pelargoniums, Myrtles, and nearly all greenhouse plants will do well thus, and if the box can be kept in a greenhouse, will do better and strike sooner.

Many things root readily in Cocoa-nut fibre refuse mixed with sand. All cuttings should be growing when taken; they should be cut clean off with a sharp knife, cutting just below a joint and in a sloping direction; the lower leaves should be removed and the slip planted at once. As soon as the young roots are 1 in. long, or even less, pot off singly, and do not wait until the roots are a tangled mass, and have

to be broken. After potting off, keep close for a few days again, until they are rooted out.

TREES AND SHRUBS.

(See p. 39.)

Trees Suitable for Towns.—The Occidental, or Western Plane (*Platanus occidentalis*) is by far the most successful subject for planting in large or smoky towns, or indeed anywhere where a vigorous growth and handsome foliage is desirable. It seems, indeed, to flourish, if planted with any degree of care, under almost any conditions, succeeding equally well in a hot climate or a cold one, in air pure or quite the reverse. It is now too well known to need description, but the habit and outline, or shape, are undeniably handsome, and when in good health and full leafage it becomes an extremely elegant object. It cannot be too freely planted in parks, streets, avenues, squares, or in any available position in or near cities; and for such a purpose a better tree cannot be found. There are several varieties with more or less variegated foliage, all of which are desirable, though, as a rule, they are not quite so robust as the type.

The Oriental Plane (*P. orientalis*) is not so desirable for city planting as the former variety, but still it may be classed as eligible for all but the worst localities, and is worth a trial if only for variety. No other kind of Plane is nearly so suitable as these for the purpose now under consideration.

Perhaps the next best tree for town work is the Black Italian Poplar (*Populus acladesca* or *monilifera*). It is a quick grower, and its habit renders it very suitable for planting in streets or avenues. There are many forms of *Populus*, but on the whole the above is the best of the lot for withstanding smoke and dust, though the Lombardy Poplar (*P. dilatata*) is very good, and even more suited to street planting than the former. The Abele tree (*Populus alba*) is extremely handsome, and though not so hardy and vigorous as the two last, might reasonably have a trial, especially in suburban districts, or where there is a little open or breathing space, as in town parks. The lower side of the leaves is quite silvery, and gives a charming effect in a breeze. Other varieties of Poplar are *P. canescens*, *P. tremula* (the Aspen), and *P. cordata*, with large foliage.

The Lime tree, though not well spoken of by some, is nevertheless found in practice to be a capital city tree, its only fault being that in dry hot seasons it becomes discoloured before the summer has fairly left us, and has sometimes almost entirely lost its foliage by the advent of autumn. It is an elegant tree, and the beautiful fresh golden-green of even the common variety (*Tilia europaea*) is a refreshing object for the eye to rest upon. There are now several forms of the above, varying in the shape and colour of the foliage.

The golden-leaved American Lime (*T. americana argentea*) is one of the most effective. A very good variety is *T. mississippiensis*, the foliage of which, when young, is of a lovely golden hue, and the shape of the tree is also fine.

Salix caprea, the Palm Willow, grows well; it may be seen in fine condition in and around Glasgow. Other varieties of Willow, such as *S. babylonica*, the Weeping Willow, would probably succeed. *Catalpa syringæflora*, from North America, succeeds well as a town tree in a moderately warm climate. It would do well in London or Bristol, but we should not recommend it for northern towns. It is a great favourite on the Continent; and its large foliage and white blossoms make it extremely attractive where it does well. The Japanese Paulownia (*P. imperialis*) is a first-class city tree. It also prefers a warm climate, and does well in Paris. The foliage is large, and seems to stand any amount of heat and dust uninjured; the habit is also good. The common Fig (*Ficus carica*) flourishes as well as, or better than, almost any other tree, no matter how confined or smoky the situation. Unfortunately it seldom acquires any considerable size as a standard anywhere but in the extreme south of England, as its large handsome leaves render it a striking and beautiful object. It seems to attain its greatest size where it enjoys some protection and support, as against a south, east, or west wall.

Ailanthus glandulosus, the "Tree of the Gods," is also a fine city tree. The foliage is extremely handsome, being somewhat similar to that of the Sumach (*Rhus*); and it seems to stand drought and dust equally well with the Plane tree. It does not usually attain any great size, a point which renders it, with the Fig, suitable for gardens where the room is limited. Its leaves form excellent food for the silk-worm.

The Locust tree (*Robinia pseud-acacia*) may be taken next: it usually does well, though it is late in putting on its foliage, and though for a short time exceedingly beautiful, soon loses it again. This and *R. bessoniana* are about the only two of this family worth growing, except perhaps *R. Decaisneana*, with rosy flowers.

Some of the Bird Cherries (*Cerasus*), especially the double American, do well, and when in flower, in spring, form very handsome objects. *C. ranunculiflora* and *C. Sieboldi* also usually succeed. The common Elder (*Sambucus nigra*) does extremely well; though not very ornamental, it produces broad panicles of very sweet-scented flowers, and there is a golden-leaved, or rather variegated, form, which is really pretty. Some Maples, especially *Acer platanoides* and *A. monspessulanum*, do well, and are very pretty, though the variegated forms, of which there are now so many, being more delicate, should be tried with care.

The Common Almond (*Amygdalus communis*) will succeed on the outskirts of large, or anywhere in moderate-sized, towns. The Sweet and the Bitter Almond (*A. communis dulcis* and *amara*) may likewise be employed. The *Amygdalopsis*, a very showy tree when in flower, might be useful, but we have hitherto been unable to give it a fair trial. The worst of these early spring-flowering subjects in towns is, that the east winds so prevalent at that season being so much more injurious in their effects than in pure country air, as they most undoubtedly are, and the trees and their flowers not possessing the usual substance and hardiness, the bloom is almost invariably quite ruined before it becomes fairly expanded. The only safeguard that can be employed is to plant such as the above, the *Ribes*, and all early flowering kinds of tree or shrub where they can be as much as possible protected by walls, high buildings, &c., from the direct force of the wind on the east or north and east sides. In suburban districts, and, if well established, even towards the heart or centre of London itself, the Laburnum (*Cytisus laburnum*) will grow, and in favourable seasons even produce a fair crop of flowers. It is a universal favourite, but is rather difficult to get established in a young state where the air is bad.

Our list is now nearly exhausted, and there remain but two more subjects, and these must not be attempted in confined situations, or where the air is very impure or smoky; still they may fairly rank as good suburban trees. These are

the Horse Chestnut (*Aesculus hippocastanum*), which may take the first place as an admirable park or avenue tree. There are two varieties of this, *Aesculus rubicunda*, with deep red flowers, and *A. pavia*, both good. The second is the Sycamore (*Acer pseudoplatanus*), too well known to need comment. This we have known to do well in the inner suburbs of London without any great care or trouble.

We had nearly omitted to mention one very valuable tree. This is the *Arbutus*, which will be found not only valuable, but extremely ornamental. It will succeed well, if properly planted and a little care bestowed upon it at first, even in the most smoky districts of the largest cities. The dark glossy foliage, white flowers, and red berries of this beautiful, but far too seldom seen, tree renders it one of the most attractive subjects that can possibly be introduced into any garden.

Very few, if any, other trees, ornamental or otherwise, will be found to give anything like the same amount of satisfaction, where the air is at all impure, as those enumerated above. Hardly any Conifers will succeed in or very near towns; if any, the *Thuja* (*American arbor vita*) will be more likely to do so than any other.

Shrubs, &c., suitable for the Town Garden.—We will take these also in the order of their desirability, or as nearly so as possible, commencing with those that are sure to give good results with very little care, and ending with those that need judicious treatment, and that should be very sparingly introduced except in comparatively favourable localities.

The *Euonymus* may be taken first: it is an evergreen, and will grow, and with a little care even flourish, in any situation. The dark glossy foliage of the plain-leaved kinds, and the bright markings of the variegated varieties, are almost equally effective, though the latter are perhaps a little more delicate, or rather less vigorous, than the former. There are several varieties, all of which are almost equally desirable; there being both broad and narrow-leaved sorts of the plain section, and of the variegated, gold and silver edged, and one that is described as a tricolour. These will all grow in any soil that is worth the name, and in either sun or shade. To do well, the situation should be fairly drained, the shrubs supplied with water in dry hot weather, and, when they become established, a dressing of rotten manure applied, as they are rather exhausting to the soil.

Euonymuses grow well in pots, in which state they are very useful for window decoration in winter.

The *Aucuba japonica* is another most desirable evergreen, too well known in and around most towns to need description. Many, however, do not know that there are male and female varieties of this plant, and that if plants of both kinds are grown together in summer, so that the pollen of the one is taken by insects or wind and deposited on the flowers of the other, as is sure to be the case, the female plants become fertilized, and bear large clusters of bright red berries, which greatly adds to their appearance and value. Almost precisely the same remarks on cultivation given for the *Euonymus* apply equally well to the *Aucuba*; there is also a variegated form of it, which is very effective. The *Ribes*, or flowering Currant, is a deciduous shrub, attaining a height of four or five feet; it bears a profusion of pink blooms early in spring; but in towns, and sometimes outside, it often happens that these are almost or quite destroyed by the cutting east winds that frequently prevail at that season. But the flowers, in a favourable year, are very pretty, and the growth is very free and robust. A sunny situation and loamy soil is most suitable, but rich soil or manure is not needed. *Ribes sanguineum* and *speciosum* are both good forms.

Centranthus ruber is a splendid town plant, dwarf in growth, and having attractive red flowers. It will grow well in any town, however smoky and dirty. A sunny or partially sunny situation should be chosen, and any good light soil will grow it well.

Lilacs, of different kinds, may be taken next. Healthy plants that have been grown hard, and on not too rich a soil, if well planted, are sure to do well almost anywhere, though if the locality is very bad much bloom must not be expected. The Persian Lilac is usually much more free flowering than the common kinds, as well as more dwarf in habit, though it is rather more difficult to get established. A sunny position is preferable, but these will grow well in partial shade.

Hawthorns (*Crataegus*), of several varieties, usually succeed well, though they will not produce flowers as freely as in purer air, and sometimes not at all. Still they are very useful. The common May (*C. oxyacantha*) is much more frequently met with than any of the others, except, perhaps, the double kinds, of which Paul's new crimson is far preferable to any other, and a splendid sight when in full bloom. But there are many other fine varieties far too seldom seen, and

we would recommend *Crataegus Grandiflora*, which bears immense flowers, and is a fast and vigorous grower. *C. caroliniana*, *C. lucida*, and *C. glandulosa*, are quite as effective, and, excepting perhaps the last-mentioned one, more suitable for town culture than the common *C. oxyacantha*. *C. macracantha* is a fine variety, with brilliant coloured fruit; and while amongst these the beautiful evergreen *C. pyracantha* may be mentioned, though its growth renders it only suitable for training on walls, &c., for which purpose it is decidedly the best thing we have.

The common Sumach (*Rhus glabra*), as well as its still more beautiful congener, *R. glabra laciniata*, is a capital town shrub, or small tree. A strong plant, carefully put out, is sure to do well, and the beautiful foliage, even of the commoner variety, renders it an ornament in any garden. The cut-leaved form is still more desirable, and a well-grown specimen yields to no plant that grows for beauty. Any good loamy soil and a warm sunny position suit these well.

The Tree of the Gods (*Ailanthus glandulosa*) may be taken as a companion to the above, which it somewhat resembles in appearance and the treatment required.

The Cuba, or variegated Laurel, usually does well, which is more than can be said of the common Laurel, or of the Laurustinus. This does not seem to mind smoke and dirt much, if the place where it is planted is not too much confined.

The Gum Cistus (*C. ladaniferus*) is a very good town plant, and as it is an evergreen, or nearly so, and bears beautiful flowers as well, it is extremely desirable. We have seen these, healthy and flowering profusely, in the worst part of Southwark, not far from London Bridge. A sunny position is suitable, and good loam is the best kind of soil for this.

The Arbutus Unedo makes a beautiful shrub when in a small state, and will grow almost anywhere. (See "Trees.")

Acanthus of sorts, especially *Latifolius*, may be grown well, with a little care, in most places. The foliage of these is extremely handsome.

Rhododendrons, particularly robust growing sorts, will be found splendid things if well planted in proper soil, in not too confined a space, and properly cared for and kept clean afterwards. That they will do well, even in the heart of London, is abundantly testified by a sight of those growing in St. Paul's Churchyard, which are thriving, and flower profusely. The way to obtain good results is to plant with

great care, in a well-drained position and good peat soil, sturdy well-grown plants of vigorous and robust sorts. The soil must, of course, be made very firm around the roots, abundance of water must be given in the growing season, and when the plants become established—that is, the roots obtain a good hold of the fresh soil—pretty frequent doses of good manure water may be given with advantage in dry weather, when the plants are in full growth. But the most important point is to keep the plants clean by the almost constant use (except in wet weather) of the hose or garden-engine; do not spare the water, but give it them from all sides, and as forcibly as they will bear without injuring the foliage. Powerful syringing, by some means or other, is very important for the well being of all kinds of trees and shrubs in town, more particularly in the case of those with large or glossy leaves, but no plant is benefited by so free an application as the Rhododendron. These plants are the better for slight shade from very hot sun when the foliage is young, but this is not absolutely necessary. *Escallonia macrantha* is a very handsome shrub, which will succeed in all but the worst localities. It has glossy foliage, which is easily kept clean, and red or scarlet tube-shaped flowers. It is best planted in a somewhat peaty soil, in a border under a south wall, as, except in the south of England, or in favoured spots, it cannot be said to be quite hardy. It may be planted quite close to, and trained and nailed against, such a wall, very readily and advantageously. *Weigelia rosea*, and its variety *alba*, is a favourite with many, and as a town shrub should perhaps take place before some others previously mentioned, as it will grow almost anywhere, and flower in most places as well. But the fact of its being deciduous is somewhat of a drawback. Its flowers, however, are very beautiful, so that it is the best. A warm sunny situation, sheltered by a wall or fence, is the best. The common French Willow of cottagers' gardens grows well, and is very pretty nailed up to a wall. Lastly, *Forsythia viridissima* and *suspensa* are both very desirable free flowering subjects, which will do fairly well in most places if carefully planted in proper soil and a warm situation.

In addition to the above, there are several subjects which are really trees, but in a small state may be successfully employed for the decoration of the town garden. These include several that have been treated on in the chapter on trees: they include the Almond, Fig, Cherry (double), Catalpa, *Paulownia*, Laburnum, &c., as well as some forms of

Maples, such as the beautiful variegated *Acer negundo variegatum*, which, grown as a standard, cannot be surpassed for effect. This, however, with most of the Japanese section, are rather more delicate than the commoner varieties, and should therefore be sparingly planted in smoky districts, though in most suburbs they would succeed well. On the borders or outskirts of cities, or wherever the air is comparatively pure and fresh, many other shrubs may be added to the foregoing list, such as Laurels, *Laurustinus*, Bays, Hollies, Magnolias, &c.; and such things as Lilacs, &c., will flourish with very little care. The Magnolia, however, it is only right to state, we have sometimes seen doing well in the most crowded and unlikely neighbourhoods. On walls or close places, as before stated, the Virginian Creeper in its different forms, the Vine, Jasmine, particularly the common white, Ivies of sorts, Magnolias, hardy Clematis, &c., will be suitable anywhere; while many shrubs, as the *Cydonia*, *Ribes*, *Weigelia*, and others may be trained in such positions with good effect. A little farther out *Passiflora caerulea*, *Wistaria Punica* (Pomegranate), and others may be added. But anywhere and everywhere where a place for it can be found, the beautiful *Crataegus pyracantha* should be planted. It is sure to do well, and is a "thing of beauty" at all seasons. *Cotoneaster microphylla* is another berry-bearing evergreen which may be grown as a small shrub, or nailed against a wall with good effect in suburban districts.

HINTS ON PLANTING TREES.

So many failures occur in the planting of trees and shrubs in towns, and the demand for something of the sort is now so great (and properly so; we should be glad to see five or six times the area of parks and open spaces, and ten or twenty times the number of trees planted that now exist), that we think a few remarks, the result of practical experience, which we only wish was larger, will be useful.

The most suitable varieties for planting in towns having been considered in previous chapters, now for the time and mode of planting. The best time for planting trees in towns is not in the autumn, as is done in country places, but in the spring, just when the trees are starting into growth; for the winter is such a fearful ordeal to all vegetation, especially when the poor things have just been removed from the sweet country air, that unless somewhat inured to their new

and unfavourable surroundings, and unless the trees have some hold of the ground before the severe weather comes, it is apt to go hard with them. Now by planting in spring the shock is not so great, as the air in summer, as we have so often remarked, is infinitely purer than in winter, and the sunshine, &c., and frequent waterings they may have, all tend to make the change not so great as it would be if removed in autumn.

One of the great reasons why autumn planting is so successful under ordinary circumstances is that the ground in October still retains a quantity of the heat imparted to it during the summer, which promotes root-growth while the cool air above checks any excitement in the branches; but we must remember that the temperature of the air even is some degrees higher in London or any large town than in the country, and the difference of temperature of the soil, &c., is still greater, for the ground being to so great an extent covered with houses, in which fires are always burning, cannot become penetrated by frost and cold as it is in the country; besides the great amount of drainage, &c., causes the soil to be much drier and therefore warmer. Therefore, for many reasons, and also because experience shows it is the correct plan, plant in spring, and we should say that May was the best month, though April might be as good, or even March.

Now, let us consider how to plant. We would say, in the first place, do not trust to the soil in a London street, or that of any large town. Even if the soil itself were pretty fair, the very fact of its having been shut out from the action of the sun and air by paving-stones and flags for years, as is generally the case, will have rendered it utterly unwholesome, at least on the surface, and the subsoil is not of much use. It will also have been rammed and beaten into a hard and caked condition by the constant traffic, and no amount of working can bring it into a wholesome state. Manure is inadmissible for trees, as it causes a soft and rank growth which does more harm than good. So that on the principle "that if a thing is worth doing at all, it is worth doing well," which we always follow and recommend, by far the best plan is to bring some nice fresh loam from the country; just enough to each tree to start it will do, say a cart-load or a "yard" to each, but if you can give more, do so. The loam, if pretty good, will do by itself, but if anything is needed to give it richness, use a little leaf mould.

Dig the hole for each tree as wide as you can—depth is

not of so much importance; 5 ft. is sufficient—and we think it best to make a pretty hard bottom by ramming in 1 ft. or more of gravel, for tap roots should be prevented, or at least checked. If you must use any of the old soil, work it up well, and we should recommend its having been excavated some time previously and turned over frequently in heaps exposed to frost or sun. Use this more round the sides of the hole, which should be certainly 6 ft. in diameter, and as much larger as possible, and use the fresh stuff round the roots of the tree. Make the soil firm, and leave a hole for the tree. These should be strong saplings of 6 or 8 ft. high, but we do not recommend their being much larger, as the check is sometimes fatal to large trees. They should have been grown in a rather exposed situation or district, so as to be very tough and hardy in constitution. It is better, too, to have trees that have been transplanted frequently, and they should not have been in their last situation too long, so that any large roots have to be cut in lifting. It would perhaps be advisable to have cut round the roots, doing half at a time, the two previous years, and the trees should be lifted and planted again with as large a ball of roots and earth as possible left undisturbed.

All these points will tell. Plant firmly of course, but leave the surface a little rough, and not trodden more than is necessary. Now, if it can possibly be managed, do not shut out the roots from the healthy influences of the sun and air, but leave the soil exposed for as large a space as possible, and put a light iron or wooden railing round to keep off enemies or intruders. A space at least 5 ft. or 6 ft. in diameter should be left and railed in in this manner. It is scarcely necessary to say that the tree should be planted high, and the soil made to slope gently down all round.

Watering should be attended to, for the trees, especially if planted on a prepared and drained station as described, will need more than the natural supply in dry weather—more than they would need in a country place. Yet not too much must be given, and an experienced man should be permanently employed where a number of trees have to be attended to, to see that they are kept in a proper state and condition of soil, &c. The trees would be greatly benefited by a good showering from a hose-pipe over the foliage every morning early, or evening, in hot or dusty weather, especially for the first year, and, indeed, during all the years of their life. A judicious pruning out of all dead branches, &c., and stopping of any long coarse shoots, should be regularly persevered in.

In the case of planting in parks, gardens, or any open, unpaved situations, of course so much care need not be taken ; and if the ground has been uncovered by paving, houses, or anything of that sort, as in the case of market or private gardens, &c., the soil may be found in such a good condition that little or no fresh or virgin soil need be employed. But we should always prefer to use a little stuff (loam) just to start the trees, and on the surface, as, if we leave out the fact of even suburban soil being always more or less impregnated with soot, &c., yet any soil that has been worked, manured, and heavily cropped for a number of years, as a market-garden would be, is nothing like so suitable for the growth of trees or shrubs, even if in "good heart," as the farmers say, as pure and unadulterated natural loam. But always leave the ground for a few feet round each tree as free and open as possible—grass does no harm—but do not put gravel, or anything that is likely to be trampled down, and if there is any danger of many footsteps, put a railing or other protection round, at least, for the first few years, until the tree gets well established.

The above remarks on planting apply equally well to the treatment of shrubs as trees, only on a smaller scale. One or two good wheelbarrows of loam will be sufficient for a shrub. Plant in spring, and syringe the plants freely in bright weather.

Alphabetical List of Trees suitable for Town Gardens.

Those that will succeed in the worst positions are marked thus (*); the others need care, or are better suited for suburban culture.

Acer, *platanooides and *mons-pessulanum (Maple)	*Corylus columa (Constantinople Nut)
Acer pseudo-platanus (Sycamore)	Cytisus Laburnum (Common Laburnum)
Æsculus hippocastanum, rubicunda and pavia (Horse Chestnut)	*Ficus carica (Common Fig Tree)
*Ailanthus glandulosus (Tree of Heaven)	Magnolia grandiflora, triplata, &c. (Umbrella Tree)
Amygdalus communis (Common Almond)	*Morus nigra (Mulberry)
*Arbutus unedo (Arbutus)	*Paulownia imperialis (Japanese Paulownia)
*Catalpa syringæflora and other sorts	*Platanus occidentalis and orientalis (Plane Tree)
Cerasus padus, fl. pl. ranunculiflora and Sieboldi (American or Bird Cherry)	Populus *monilifera and *dilatata
	Populus alba, canescens, tremula, cordata

<i>Robinia pseud-acacia</i> (Locust Tree)	<i>Salix babylonica</i>
* <i>Sambucus nigra</i> (Common Elder)	* <i>Tilia europaea, americana, a. argentea</i>
<i>Salix caprea</i> (Palm Willow)	, mississippiensis

Alphabetical List of Shrubs for Town Culture.

<i>Acanthus</i> , of sorts (Bear's Breech)	* <i>Euonymus</i> , in variety
<i>Acer negundo variegata</i> (variegated Japanese Maple), as a standard	<i>Forsythia viridissima</i>
* <i>Ailanthus glandulosus</i> (Tree of Heaven)	* <i>Lilacs</i>
* <i>Arbutus unedo</i>	<i>Ligustrum</i> (Privet), of sorts
* <i>Aucuba japonica</i> , both plain and variegated	<i>Magnolias</i>
* <i>Cistus cyprinus</i> , or <i>ladaniferus</i> (Gum Cistus)	<i>Pæonia</i> , tree
* <i>Corylus</i> (Hazel), of sorts	* <i>Rhododendrons</i>
* <i>Crataegus</i> (Hawthorns, of sorts)	* <i>Rhus glabra</i> (Sumach) and <i>R. g. laciniata</i>
<i>Escallonia macrantha</i>	* <i>Ribes sanguineum</i> and vars. (Flowering Currant)
	<i>Spireas</i> , of sorts
	* <i>Weigelia rosea</i> and vars.

Alphabetical List of Climbers for Town Culture.

* <i>Ampelopsis hederacea</i> , Veitchii, &c. (Virginian creeper)	* <i>Jasmines</i> , of sorts
<i>Clematis</i> , of sorts, such as Jack-manni	<i>Magnolia conspicua</i> , and vars.
<i>Cotoneaster microphylla</i>	<i>Pyrus</i> (<i>Cydonia</i>) <i>japonica</i> . (Japan Quince)
* <i>Crataegus pyracantha</i> (Fiery Thorn)	* <i>Vitis</i> (The Vine)
* <i>Hedera</i> (Ivy), of many varieties	* <i>Weigelia rosea</i>
	<i>Wistaria sinensis</i>

PLANTS FOR OUTDOOR GARDENS.

For greater convenience we give three separate lists—the first containing those plants that will do well in any situation, however bad, with moderate care; many of them indeed will grow almost anyhow and anywhere, though of course if carefully cultivated they will give better results. The second list contains the names of such as require more care and attention than the first, special soil, &c., to do well, or that would do well in suburbs or small towns. And the third list, such as cannot be made to grow at all in town air, or that will at best only drag out a miserable existence for a year or two, and give more pain than pleasure to their owners. It must be distinctly understood that all the subjects mentioned in the second list may be successfully cultivated in such suburbs as Camberwell, Peckham, Brixton, Battersea, Paddington, Islington, Hoxton, Bow, &c.; those

in the first list are only for *very* bad districts. After the lists we will take the most desirable kinds separately, and give instructions for their successful cultivation, with the soil most suitable for each, and so on. The lists are all arranged alphabetically for greater convenience. We do not strictly adhere to the botanical names, but give those by which the plants are generally known. Those that are most easily cultivated are marked thus (*), and those marked (†), though really perennials, are better treated as annuals.

FIRST LIST.

Hardy Plants.

- | | |
|--|--|
| Aconite (Eranthus hyemalis)
yellow | Lilies (white garden and Tigr.)
Linum flavum, narbonense and
perenne |
| Asclepias tuberosa (Swallow-
wort) | *London Pride
Lythrum virgatum, roseum
superbum, &c. |
| *Auricula
Campanulas, of sorts, such as
calycanthema, pyramidalis, &c. | *Michaelmas Daisies (perennial
Asters) |
| *Canterbury Bells | Papaver (poppy) bracteatum,
orientale, &c. |
| *Centranthus ruber | Paeonies |
| *Chrysanthemum (old early,
yellow, white, and red are best) | Phlox, herbaceous |
| Commelinacelestis (Spider-wort) | Plumbago larpentea |
| Cowslip | Polyanthus |
| *Creeping Jenny or Money-wort
(Lysimachia nummularia) | *Primroses |
| Crocus | Pyrethrums, double |
| Daffodils | Rose Campion |
| Day Lily (Hemerocallis flava and
graminea) | Saxifraga crassifolia, ligulata,
longiflora, &c. |
| Delphinium (perennial Lark-
spur), in variety | † Snapdragon (Antirrhinum) |
| Diclytra spectabilis | Solomon's Seal |
| *Evening Primrose ((Enothera
Lamarckiana or grandiflora) | Sweet Williams (Dianthus) |
| Everlasting Pea (Lathyrus lati-
folius and grandiflorus) | Tritoma Uvaria (Flame flower) |
| Geum coccineum | *Thrift (Armeria) |
| *Hyacinth (wild) | Tradescantia virginica |
| *Iris (German and common
yellow, also other varieties) | Tritomea aurea |
| | Veronica (herbaceous, blue)—
Speedwell: some of the best
are V. incana, repens, rupe-
tris, and spicata |

Half-hardy Plants Needing Protection in Winter.

- | | |
|------------------------|--|
| Aspidistra lurida | *Chrysanthemum (show or ex-
hibition varieties) |
| *Calceolaria (shrubby) | †Cineraria (maritima and candi-
dissima) |
| Cannas | |
| *Carnations | |

- *Dahlias
- Fuchsias, a few kinds
- *Geraniums (zonal and Ivy-leaved, not tricolors)
- †*Golden Feather (Pyrethrum aureum)
- †*Lobelias, both dwarf blue and herbaceous (cardinals)
- †*Marvel of Peru (*Mirabilis*)
- *Mimulus
- †*Petunias
- †*Pinks (Indian and Chinese)
- †*Verbenas

Annuals.

- *Amarantus (mel. ruber and varieties)
- *Asters
- Balsams
- Calochlora
- *Candytuft
- Cannabis (Hemp plant)
- Chrysanthemum (annual)
- *Convolvulus major and minor
- *Corn flowers (*Cyanus*)
- Eschscholtzia
- *Helichrysum (Everlasting flowers)
- Larkspur (annual)
- Maize (striped Japanese)
- *Marigolds (French and common garden)
- *Mignonette
- *Phlox Drummondi
- Poppy
- Ricinus (Castor Oil plant)
- Silene pendula and varieties
- *Stocks (German and Virginian)
- *Sunflowers
- Tropaeolum (*Nasturtium*)
- *Venus' Looking-glass
- Zinnia

SECOND LIST.

Trees and Shrubs, &c.

- Almond
- Amelanchier vulgaris
- Barberry (Berberis Darwini, best)
- Clematis (preferably montana) Jackmanni vars. will also succeed
- Forsythia viridissima
- Horse Chestnut
- Kalmia latifolia
- *Laburnum
- Laurustinus
- Lignum vitae
- Magnolia conspicua
- Passiflora cerasina
- Persian lilac
- Privet
- *Poplar and Aspen
- Rhododendrons, hardy
- Sycamore
- Syringa
- *Wistaria

Hardy and Half-hardy Plants.

- Anemone coronaria, fulgens and japonica
- Campanula (pyramidalis and carpatica, &c.)
- Ferns (hardy)
- Foxglove (*Digitalis*)
- *Fuchsias (some kinds)
- *Gloriosa
- Godetia (annual)
- Helleborus niger and vars. (Christmas rose)
- *Hollyhocks
- *Hyacinths
- Lily of the Valley (*Convallaria*)
- Liliums, auratum lancifolium, &c.
- *Lupins
- Pansy (vigorous varieties)
- Pentstemons
- *Perilla nankinensis (annual)
- *Phlox (perennial)
- Pinks (Garden)
- Salpiglossis (annual)
- Scabious
- *Stonecrops (*Sedums*, varieties of)
- Tulips
- *Wallflowers

THIRD LIST.

Includes nearly all Forest Trees, Oak, Ash, Elm, &c., in any smoky or thickly populated districts.

Shrubs.

Azalea	Heaths (Erica)
Broom	Holly
Guilder Rose	Laurel

Plants.

Anemone	Pelargoniums (zonal tri-colors)
Coleus	Portulacas
Cuphea	Primula acaulis fl.-pl., the Spring flower
Daisies (Bellis)	Roses
Gentians	Sweet Peas
Hepaticas	Violets
Hibiscus	Violas
Linums (annual)	
Pansies	

DETAILED CULTURE OF PLANTS.

We will now take the most suitable of the plants given in the foregoing lists in alphabetical order, and give the most successful mode of culture for each.

Acanthus latifolius., a fine-leaved shrub, fine as a single specimen on lawn, or for a pot plant. In very bad districts it would be well, where possible, to take up and pot this plant in autumn, keeping it in greenhouse or sitting-room through the winter; or grow altogether in pots, merely plunging out of doors in summer.

Aconite (Eranthus).—This is the earliest flower we have, coming into bloom in January or February. A rather shady position in a good stiff soil suits it best: it grows well in turf.

Amarantus melancholicus ruber.—This plant is very useful for bedding; the deep blood-red of the leaves is very effective, especially when the sun shines through them; moreover, it grows very freely. It is about 1 ft. in height. Seed should be sown in a light rich soil, consisting chiefly of leaf-mould and sand, as early as possible, say March, and placed in a steady heat of about 70°. Prick off into boxes when large enough, and keep on growing in gentle heat. The plants are better potted off separately as soon as large enough, lifting them from the boxes with good balls of earth, as they cannot bear to have their roots broken. Harden off

gently towards the end of May, and plant out early in June. It may also be sown in a cold frame in April, or even out of doors at the end of that month. Plant about 1 ft. apart.

Anemones will only do on the outskirts of a large town. They should have a well-drained, dryish soil; a moderately rich, sandy, peaty loam is about the best, and they must have a sunny situation.

Aquilegias (Columbines) will succeed if the situation is not too confined, or the air very bad. They are not very particular as to soil; a good rich loam suits them well, and they should have a partially shaded position. Almost any of the vigorous varieties, such as *alpina*, *coerulea*, *glandulosa*, will be suitable.

Aspidistra lurida, a fine plant for hot dry situations. If a small heap of ashes is placed over the crown in winter, it will, if well established, survive most winters.

Asters.—Unlike Stocks, these should not be sown too early; the flowers are not wanted till quite autumn, and the first week in April is quite early enough for them; successional sowings may be made up to the middle of May. The great points in the successful growth of Asters are to give them a very rich soil at all stages, and never to allow the plants to receive a check in any way. They should be treated the same as Stocks—*i.e.*, sown either in a very gentle heat or in a cold frame, greenhouse, or window, in well-drained pans or boxes of light soil; leaf-mould and sand is the best, with little or no loam. Keep them close to the glass, so that they do not get at all drawn. Prick them out when large enough and getting crowded into protected nursery beds or cold frames, and when good, sturdy plants of 3 in. high or so, plant out carefully with good balls of earth into beds of good, rich, and deeply-dug soil. From 8 in. to 10 in. apart is a good distance for the dwarf kinds, and 1 ft. or more for the tall growers. From first to last they cannot have too rich a soil, and a bed with a good depth of decayed turf sods and old manure, and a layer of rather fine, light soil, such as equal parts of loam, leaf-mould, rotten manure, and some sand, on the top, will grow splendid flowers. They must have plenty of water in dry, hot weather, and, unless the soil is very deep and rich, a good soaking of liquid manure occasionally as they throw up for bloom. Asters need an open and sunny situation. In pots they are very useful in autumn, but it is a difficult matter to grow them so. The only way is to plunge the

pots in cold frames or pits and give abundance of air. But it is far easier and quite as good a plan to grow the plants in open borders in the usual manner till the blooms are just opening, and then take up with good balls, having given them a good soaking some hours previously, and put as many in a pot as it will hold. In this way they take no harm.

There are a number of very distinct kinds of Asters, of which the quilled or German, and the French or flat-petalled, are the two great classes, the latter being in our opinion by far the most desirable. The French are divided into the Chrysanthemum or reflexed, and the Paeony or incurved kinds. Besides these are the Victoria, the Emperor, and other kinds having reflexed petals. Nearly every class can now be purchased in tall or dwarf kinds, the former growing to a height of 18 in. or 2 ft., and the latter to 8 in. or 1 ft. only. The tall kinds are very fine for single specimens, or for groups in mixed borders, but for bedding purposes the dwarfs are much preferable. The most suitable for this purpose is the dwarf Chrysanthemum, which makes a most beautiful bed either with the colours arranged separately in bands or mixed. The Victoria produces the most perfectly finished blooms, but what is known as the Paeony Perfection Aster gives us the most handsome flowers, to our taste at least, of any, the shape being very similar to that of the flowers of the incurved Chrysanthemum.

The Perennial Asters, usually known as Michaelmas Daisies, are an extremely useful and showy class of plants, of much the same habit of growth and character as the Chrysanthemum. They merely require planting in a bed of good soil, and staking as they grow. The old stools may be divided, or young plants from cuttings be raised, when they get too large.

There is a very large variety of these plants, but some of the best for town culture are—

Aster—	
Amellus	Nova Angliae
Cordifolius	Nova Belgii
Elegans	Purpureus
Longifolius formosus	Spectabilis
Leavis	Tradescanti

Most of these bloom in the autumn months—September to November. They are among the most valuable of town plants.

Auriculas.—This is a splendid town flower, as the

beautiful plants grown by the Spitalfields weavers can testify. The ordinary garden or alpine Auriculas are the best for out-door culture, as the show kinds are more delicate, and it is usual to grow them in pots. The alpines may also be grown in pots with good results. Hardy Auriculas will stand a town winter better than any plant with which we are acquainted, and will start into growth and bloom early in spring with wonderful vigour. They should have a situation sheltered from the rays of the summer sun at mid-day; at the foot of a north-east or north-west wall is a good place, but the position must not be damp in winter, or they are apt to rot off. The best soil for them is a rich loam, but they will grow well in almost any good garden soil. After they have bloomed, and it is well to give them some protection from east or biting winds when in bloom, take up the plants, remove the young suckers, and plant them separately; either plant the old root again right up to the leaves, or throw it away. But if you can afford the plants the shelter of a frame, far better results can be obtained by growing choice sorts in pots. Either the alpine or show kinds, or both, may be thus grown, and neither of them require any artificial heat at any season. The show kinds are more delicately beautiful, but they are not so hardy or free flowering as the alpines. Both require as nearly as possible similar treatment. The main thing is to give them plenty of air and light, and never let them flag for want of water; yet they must never be too wet, especially in winter and about the stems, as they are rather apt to damp off there. The best soil is a good rich fibrous loam, with a small proportion of very old manure or leaf-mould, and a little sand if needed, but if the loam is not very stiff it is better omitted. Four and a half or 5-in. pots are quite large enough for single plants; pot them pretty deep—up to the healthy leaves, all dead or decayed portions being removed, and rather firmly, but not too much so. The best time for potting is when the offsets that form after flowering are well developed and rooted, so that these may be removed and potted separately at the same time. This will be about July, the plants having been well exposed in a shady place from the time flowering is past. Pot the suckers, if at all small, in 3-in. pots, and shift them on into 4½-in. or 5-in. when ready. After potting, place the plants in a frame under a north wall, so as to be in the shade, and keep them close for a few days, till the potting is recovered, then gradually accustom to plenty of air, and in September remove

from the shady place to their winter quarters, which should be a box frame facing full south. This should have a raised stage or shelves arranged within it, so as to keep the plants off the ground and near the glass; if there are doors or movable boards at the bottom that can be removed to admit air from beneath, all the better. The plants should be stood in this and the lights kept tilted, so as to admit plenty of air, and removed for an hour or two on fine mornings and evenings altogether. Be careful how you water them, and in doing so be sure not to let any get on the leaves; remove all decayed leaves as soon as shown. Only admit air from the bottom when the weather is fine and warm. Shut up close on frosty nights, and in severe weather mat up well, and keep all close as long as the frost lasts; and for delicate show kinds it is well to bank up turf sods all round the frame, to keep out severe frost. In February take off a little of the top soil, pricking it up with a pointed stick, but not disturbing the roots, and replace with some fresh compost, made pretty rich. This is called "top-dressing," and is a great assistance to the plants; it should be done when the soil and pots are dry. Give weak manure water twice a week when the flower-buds appear, and remove any green fly that may appear with a camel's-hair brush. Shade from hot sun, and remove to a shady place by the end of April, still keeping in the frame. After flowering, which takes place in April or May, remove the plants from the frame, and stand or plunge out of doors under a north wall, or east will do nearly as well, and let them remain here till potting time comes round again; it would do just as well to withdraw the light and leave them in the frame. Keep them rather dry in winter, especially in severe weather. In potting off the offsets, if they are small, put three or four round the sides of a 4-in. or 5-in. pot, and if they have no roots at all use sandy soil, put three or four in a pot, and keep under a hand-glass or in a cold frame close till rooted. Seedlings make good plants. The seed should be sown in pans of loam, leaf-mould, and sand early in spring, and the pans placed in a cool frame or greenhouse, and kept moist and shaded. When well up and large enough, prick off separately into boxes or pots, four in a 5-in. pot. Pot off separately about September. The plants will nearly all flower in the spring following. There are a great number of fine named kinds which are preferable to seedlings where expense is not an object. A few of the finest are—

Alpines.

Brilliant	Landseer
Bronze Queen	Mercury
Colonel Scott	Mrs. Dodwell
Delight	Mrs. Meiklejohn
Diamond	Napoleon III.
Evening Star	Queen Victoria
James Fowle	Spangle
King of Crimsons	Sparkler
King of the Belgians	Unique

Show Varieties.

Admiral Napier (green-edged)	John Waterson (grey-edged)
Alexander Meiklejohn (grey-edged)	Lord Clyde (self)
Anne Smith (white-edged)	Lord of Lorne (self)
Beauty (white-edged)	Lord Palmerston (green-edged)
Blackbird (self)	Lady Sophia (grey-edged)
Catherina (white-edged)	Lancashire Hero (grey-edged)
Colonel Taylor (green-edged)	Maria (grey-edged)
Colonel Champneys (grey-edged)	Metropolitan (self)
C. J. Perry (self)	Prince of Greens (green-edged)
Complete (grey-edged)	Regular (white-edged)
Freedom (green-edged)	Rev. G. Jeans (green-edged)
George Lightbody (grey-edged)	Smiling Beauty (white-edged)

Balsams succeed well in a smoky atmosphere. They may be grown either in the open air or in pots, but as we are now treating of out-door gardening we only give the mode of culture in the open air here. The seed may be sown either in pots or boxes under glass, with or without artificial heat, or in a sunny window after April 1, or in May in the open border. For seed-sowing under glass use leaf-mould and sand, with a little loam mixed with it. A gentle heat will cause the seed to germinate more quickly. When the plants have formed the first pair of rough leaves, prick off into deepish boxes, frames, or protected nursery beds, and when strong transplant with good balls to where they are to flower. If sown late in the season out of doors, make the soil deep and rich, and merely thin out and transplant as needed. The soil for Balsams can scarcely be too deep, light, or rich, and they should have abundance of water at the root, and frequent syrings overhead. This is of great importance. A good soaking of liquid manure once a week when the plants are coming into bloom is beneficial.

Calceolarias (Shrubby).—These are very showy and useful. Where a number are required the best way is to take off nice young side-shoots with a slight "heel," and trim them neatly, removing the leaves half way up the cutting. The best time for striking them is October, not too late in

the month if the weather is very cold. Set a small frame on a piece of ground facing south and in a light and airy position; put a few inches of broken bricks, or "ballast," which is clay burnt in the rough, and is frequently used as a substitute for gravel—it makes capital drainage for pots or boxes; put a few inches of this or other draining material in the bottom of the frame, then a layer of old hops, decayed, and on that about 4 in. of fine sandy loam, with only a little leaf-mould in it. This should bring the surface of the soil up to 8 in. or 1 ft. from the glass. Make holes in rows with a dibber about 2 in. apart, put a little sand in each, and plant your cuttings, pressing them pretty firmly into the soil, but not making this too hard. Then give a good watering from a fine-rosed pot, and put on the sash, leaving the frame pretty well open till the cuttings are dry; then shut up close, and only give a little air for an hour or two on fine days. Cover the frame well up with mats or sacks in frosty weather, especially at night, when the frost is very severe; and if it is very hard, a good layer of grass sods packed closely round the sides of the frame is a great help, but it should be done before the frost sets in. Little or no water should be given until the plants begin to grow, but do not let the soil get very dry. They will not make any roots for at least a couple of months; but as soon as they have done so, and show signs of growth in spring, give a little air when safe, and as the weather gets warmer and the plants advance give more, and harden as much as possible. When they are nice, strong, bushy plants, say in April or early in May, lift them separately with good large balls of earth (having given a good watering previously), and plant where they are to flower. If they have all rooted and grown well, so as to get at all crowded before planting out time, take out every other one and either pot or plant in a cold frame 6 in. apart. In this way you will get far healthier plants than by any other method. These plants need no fire-heat, though we have sometimes put a large jar of hot water in the frame on very severe nights. The ground in which they are to grow should be well dug at least 18 in. deep, and if 2 ft. or more all the better, and plenty of good manure should be worked in, especially deep down. In this way they will keep on growing and flowering all through the summer, and not go off as they often do in shallow soil. Where only a few plants are wanted, they may be struck in wide boxes or pots, in which case it is better to take the cuttings rather earlier, and frost should be kept away during the winter. Cuttings may be

also struck in spring—March or April, but a gentle heat of about 70° is requisite to induce them to form roots at that season.

Calliopsis (or Coreopsis).—These are mostly annuals, very showy and easy of growth. *C. Burridgi* is as good as any, and all the *tinctora* varieties are worth a trial. Sow in boxes under glass, or on slight hotbed, and plant out to flower, or may be sown out of doors in April.

Campanulas and Canterbury Bells.—These are very closely related, the latter being only a variety of the former, and both need the same treatment. They are usually spoken of and treated as biennials, and the seed may be sown in July or August, in boxes, and placed in a cold frame. Prick off into frames or large boxes, if they get crowded, in autumn, protect through the winter, and harden off and plant out of doors as early as possible, in a good rich loam and sunny situation. Or sow in gentle heat in January or February, and grow on, harden, and plant out in good soil as quickly as possible. If kept growing these will flower the same autumn. The above are the only two ways of growing these pretty plants successfully, as if left out of doors few will survive a town winter. *Annual kinds are—*

C. attica

C. lorei

“ “ *alba*

C. pentagonia

“ “ *alba*

Perennial kinds are—

C. macrostyla

C. latifolia

C. carpatica

C. pyramidalis

C. cæspitosa

C. speciosa

C. nobilis

C. trachelium

C. muralis

And many others

Cannabis (Hemp Plant).—A very useful subject, with handsome foliage, for which alone it is grown. The Giant variety is more handsome and vigorous than the smaller kind. The culture is of the simplest, as a few seeds scattered where the plants are wanted will be as sure to germinate as Sunflowers, and if the soil is deep and rich the large kind will speedily attain a height of 6 or 8 ft.

Cannas.—Cannas are very useful, as their bold and yet graceful foliage shows to great advantage amongst the ordinary run of plants. They look especially well either singly or in clumps on a good-sized lawn. The plants should be put out into light, very rich and deep soil early in June, having previously been well hardened. Give plain and manure water freely at the root in hot or dry weather.

They grow very rapidly, and will form masses of robust foliage from 3 to 5 ft. high by August. Many have brilliant flowers of shades of orange and scarlet. The foliage of most is green of various shades, but Biborelli, Hostei, purpurea, and zebrina have bronze and purple leaves. In a well-drained dry soil they will usually live through the winter, if cut down and a heap of ashes put over the roots. Seeds sown in a good heat in March make large plants the same year.

Carnations.—These comprise two great classes, the tree or perpetual, and the ordinary garden kinds. The former grow to a great size, and are generally regarded as greenhouse plants, as, with proper treatment and in a genial temperature, they may be induced to produce their beautiful flowers in winter. But it is very difficult to get them to do so in a town; and as we are now dealing with out-of-door plants, we confine our observations to the ordinary Carnations, which are by far the most suitable for the open border. Though it must be remarked, that if you have a low-roofed glass-house without fire-heat in which you can grow and flower these lovely flowers in pots, you will succeed better than by keeping them exposed. When planted out during summer they must be wintered in a cold frame or other suitable quarter; a sitting-room window will do.

Out-Door Culture.—We will take the out-door culture first, and then give instructions for growing in pots for the benefit of those who have the conveniences for doing so. Nice healthy plants should be obtained about May; it is not advisable to plant out before the beginning of this month in towns. We prefer those that have been potted separately and kept through the winter in large 3-in. pots, or if forward, they may have had a shift into 5-in. or 6-in. early in spring, and be planted out from these. Choose a nice sunny position, sheltered from cutting winds, and prepare the border by digging it deeply, and incorporating a good quantity of thoroughly rotted manure; anything that has been burned in any way, especially such as charred turf, may be added in liberal quantities to the soil with advantage. But be careful to see that there are no wireworms in the soil, for these are deadly enemies to Carnations, and indeed to all the Pink or Dianthus family. Put the plants in firmly, and make the soil solid all around them. Water in dry weather, and when they run up for bloom, tie the stems neatly to slight, but sufficiently strong stakes. They will flower in July or August.

Propagating.—This is done in two ways—by layers, and

cuttings, or pipings. The first is the most simple and general. In August, as early as possible, take the "Grass" or shoots that have no show of flower upon them, and prepare a place for each by making as many shallow holes or "scoops" in the soil close round the old plant as there are shoots to be layered; and prepare them by putting a good handful of sweet, fresh, sandy loam, with a little leaf-mould mixed with it in the hollow for the layer to root into. Then, having some silver sand and a supply of large hair-pins or hooked twigs cut from pea sticks or the like, take each shoot and with a sharp knife cut half-way through it in a sloping direction, and from underneath, just where it makes the bend upwards, or where the strong green leaves begin to cease, and the stem looks brown and shrunken. Put a little sand for it to rest on, and peg it down carefully into its place, putting a little sand round the cut, and a handful of the loam on the top; press all firm, and give a good watering to settle the soil. They must not be disturbed till November, when they will be rooted, and should be carefully lifted with balls of soil, and potted singly in 3-in. pots, using rich sandy loam. Keep them rather dry in a cold frame during the winter, with plenty of air on all favourable occasions, but keeping close shut up and well matted in hard frost. In spring plant out again as before directed. Cuttings should be taken earlier, and if any quantity are wanted, prepare a small frame for them by setting it on a bed of nice, sweet, mild, fermenting materials that will ensure gentle and steady heat. Place a few inches of drainage in the frame, and on that some nice sandy loam. The cuttings should be 3 inches or 4 inches long, cut neatly just below a joint, or pulled out at the joint, and any film of fibre trimmed off with a sharp knife. Set these in the bed pretty thickly, and give a good watering, enough to make the soil like so much mud. Let the leaves dry, and then shut the frame up close, and admit little or no air until they are well rooted, which every one will be, if properly done, in about six weeks; then pot off singly in 3-inch pots. Keep close for a short time, then harden well, and keep through the winter the same as plants from layers. If taken in July, cuttings will usually root without any artificial heat, but they must be kept close until rooted.

Culture in Pots.—Good strong plants, such as those described above, always choosing the best, should be taken about March, and potted direct into the pots in which they are to bloom. These may be 7 in. or 8 in. wide for ~~the~~ very

strong one, or two or three, or even four may be put in a pot from 8 in. to 11 in. wide. The soil should consist of three parts good turfy loam that has been either partially burned or well exposed to the action of the frost out of doors, and one part of well-rotted manure, with a little crushed charcoal, and some sand if needed. Pot the plants very firmly, give a moderate watering, and place in a low, airy, and very light house—either a span-roof or a lean-to will do, but the former, running north and south, is preferable. Give abundance of air and no shade. Water only when the soil is dry, and as the flower-buds expand give liquid manure twice or thrice a week. Thin out the buds if numerous; the first, or top bud, the third, and fourth or fifth, or sometimes both, are best to leave, as a rule. Stake as required. When the flowers are over remove from the house, and stand out of doors on boards or slates, to keep worms from entering the pots. To take layers from the plants prepare as many 3-in. pots as are required by putting drainage in them, and filling up with sandy loam. Arrange these round the old plant, and if all are plunged in some open material so much the better. Proceed exactly as for layering out of doors, but instead of a peg, a stone placed on each shoot just over the cut is generally used. When rooted, separate from the parent, and treat in the ordinary way.

Raising from Seed.—Carnations may be raised successfully from seeds. Obtain a good strain, and sow in spring or early summer in wide boxes of sandy loam and leaf-mould. Prick off and pot as required; they will bloom either in pots or the open ground the next autumn. The seed-pans and the young plants should be kept in cold frames till they are strong. When practicable, we recommend seedling plants in preference to those raised by other methods, as they are usually more vigorous and free flowering. If named kinds are employed, preference should be given to the hardy border varieties, as the show or stage kinds are frequently too delicate for town culture.

Picotees are generally associated with Carnations, but we do not recommend their being attempted in anything like impure air, as they are far more delicate and susceptible to climate than the Carnation.

Chrysanthemums.—There are several distinct varieties of this popular plant. The old-fashioned early recurved (*i.e.*, having the petals turning outwards from the centre) comprising only a few varieties, of which the best known and most useful are the ordinary yellow, white, and red, are the most

suitable for culture in towns where no protection can be given them. Not only are these hardier than the newer and more fashionable incurved kinds, but they come into flower much earlier, a great advantage, as the later ones almost always get cut off by early frosts if left exposed; moreover, it must be borne in mind that as the winter draws on the air gets more and more loaded with smoke and dirt every day, so that even if late flowers could be induced to open out of doors, they would be so dirty as not to be presentable. These early kinds require very little care. The ground should be well dug and manured for the reception of the plants, and once planted they will last for years, the only attention needed being to cut off the old stems down to the ground as the flowers wither, thin the shoots when they appear in spring, stake them as required, and give them a good soaking of liquid manure in dry weather in late summer and autumn. When the stools get very old it is advisable to separate and replant them, or get a stock of young plants from cuttings, and throw the old ones away.

A dozen good early sorts, all of which will flower before the frost comes, are—

Aigle d'Or (yellow)	Madame C. Desgrange (creamy-white, large)
Annie Mitchell (red-brown)	Nanum (creamy blush)
Cassy (pink and white)	Scarlet Gem (deep yellow)
Captain Nemo (rosy-purple)	Sœur Melaine (white)
Gen. Canrobert (yellow)	St. Mary (fine white)
Illustration (light pink)	
Madame Pecoul (light rose)	

There are also the beautiful new show varieties, many of which are incurved—that is, having the petals overlapping each other, and pointing inwards. These are by far the most beautiful, and should be grown by every one who can afford them protection of some kind when in flower, but they will not do much good without. The flowers of some of these are as large and regularly formed as a Dahlia, and far more delicately beautiful.

Next come the Japanese varieties, some of which bloom even later than the last-mentioned, and thus keep up a succession of flowers far into the New Year. The blooms of these are certainly not so neat as those of the incurved, and almost deserve the epithet so often applied to them by their non-admirers, of "ragged." Still, in their way, they are very beautiful, or at least some of them; the colours are very rich, and the flowers of several of an enormous size.

Then there are the Anemone-flowered Chrysanthemums,

which we do not recommend, unless as a variation where a large collection is grown. And lastly, the Pompons claim a place. Many of these can be grown in town, even entirely in the open, with as good results as the larger kinds, but the flowers are relatively small, and as a rule not very good in colour; still grow a few if you have room.

Annual Chrysanthemums.—Besides all these, however, there are several annual kinds, all of which do well. These are hardy, and should be sown and treated the same as other hardy annuals. The best are *C. tricolor*, *C. Burridgeanum*, *C. hybridum*, and double snow-white and golden. There are also two very good new kinds—"Lord Beaconsfield" and the "Sultan." *Chrysanthemum frutescens*, also known as Paris Daisies, or Marguerites, are very pretty and suitable for town culture.

Protecting from Frost.—If you have a greenhouse, or a few spare frame sashes or lights, by all means grow a few of the incurved kinds in pots, or even if you have a bed or border facing south, and can rig up a framework over it, on which calico can be stretched, just to keep off the cold winds and soot, &c. In this latter case, do not bother with pots, but plant them out in deep rich soil as directed for the early ones, and in October get the framework ready, and stretch the calico, or whatever you have, over as soon as early frosts or cold winds warn you that the protection is needed. Anything will do to go round the sides—old sacks, so that there are no holes in them, or oil-cloth; but for the top, which should be about 6 in. or 8 in. from the tops of the plants, as transparent a material as you can provide should be used. Glass is best, of course—the lights of frames not in use at this season coming in admirably. The covering must be partially removed, so as to admit air, whenever safe, especially if it is not glass, so as to give light as well, and on the fine, bright and clear days we sometimes experience, remove the top altogether, and the sides, too, if it is very fine.

Incurved Varieties.—A dozen of the finest of the incurved varieties are:—

<i>Empress of India</i> (blush-white, very large)	<i>Mrs. Dixon</i> (deep golden-yellow, fine)
<i>Eve</i> (sulphur-white, fine)	<i>Mrs. G. Rundle</i> (pure white, a superb flower)
<i>Fingal</i> (deep rose)	<i>Pink Perfection</i> (pink)
<i>General Bainbridge</i> (amber)	<i>Prince Alfred</i> (rose-crimson, fine)
<i>Jardin des Plantes</i> (intense yellow)	<i>Venus</i> (lilac)
<i>Mr. G. Glenny</i> (pale yellow, <i>splendid</i>)	<i>White Venus</i> (waxy-white)

Twelve good Japanese :—

Chang (dark orange-red)	James Salter (lilac)
Cry Kang, (magenta)	Jane Salter (white, striped lilac)
Dr. Masters (yellow and red)	M. Crousse (coral-red)
Elaine (white, fine)	Nuil d'Hiver (bronze)
Emperor Nicholas (red, tipped gold)	Peter the Great (lemon-yellow)
Fair Maid of Guernsey (pure white)	The Sultan (purple)

Culture in Pots.—In order to obtain fine large plants and flowers, if you can give them room, take your cuttings in autumn, but spring-struck plants are very good for ordinary display. In the former case take off the young suckers from the surface of the pots when they are about 3 in. long, just as the flowers are over, in the autumn—say November—and put five or six round the sides of a 3-in. pot, using a mixture of sand, loam and leaf-mould. They will root freely in a warm greenhouse or frame, or they will do so in a cold frame if it is shut up close, and only a little air given on fine days, and well matted up in frosty weather. In this latter case the cuttings will take several weeks to root, but will make as good plants as the others.

Potting-soil, &c.—When they are rooted, which can be seen by turning the plants out of the pots, pot them off singly into 3-in. pots, using the same soil but not so sandy as for the cuttings. Keep them close for a little time after this operation, and if they can have a little gentle heat they will root out more freely; then accustom them to plenty of air. When the roots touch the sides of the pots shift them into 5 in. ones, using a mixture of turfy loam three parts, manure and leaf-mould one part each, with a little crushed charcoal and coarse-grained sand. This compost will be suitable for every shift onward from this stage. Continue shifting them on as they require it—that is, whenever the roots begin to coil round the sides of the pot rather plentifully, it is time to give them more room; remember, if you want fine freely-grown plants and large flowers, these plants must never become what is termed pot-bound—at least until the pots in which they are to bloom are reached; it is advisable that these should be full of roots by the time the plants show flower. From the 5-in. pots they should be shifted into 7-in., and from these into 9-in. or 10-in.; and, if early, they may have yet another shift into 11 or 12-in. pots; but they should all be in their blooming pots by the end of July, so that whatever size is reached by that time there let

them stay. It is generally directed that Chrysanthemums should be in their blooming pots by the end of June, but we find that they do better if shifted a month later, as if so early, the pots become so crammed with roots, and the soil gets so "tired" and sodden with the frequent waterings, that the plants do not do so well as when shifted later. The plants must be kept under glass until the middle or end of April, when they may be placed out of doors, but must be kept from frost. When set permanently out in the open air the pots must be plunged two-thirds or three-fourths of their depth, or even right up to the rim, if possible, either in the ground or in a bed of tan, cocoa-nut fibre refuse, ashes, or other suitable material. This keeps the sun from the sides of the pots, or the roots inside would suffer, and also prevents the necessity for so frequent waterings as would be necessary if the pots were free all round. If the pots are simply stood upon the ground and the ashes or tan heaped round them, each one must stand on ashes 3-in. or 4-in. deep, or on a piece of slate, to keep worms from entering through the drainage hole, if sunk in the ground, make a tapering hole with the trowel only just large enough to take the pot up to the rim, but going down about 6 in. deeper, so as to leave a hollow space beneath for the same purpose. From the first the plants should have all the light and air possible, and plenty of room as well, and when put out of doors they must have an open and airy position, exposed to the full sun. Do not attempt to crowd them at all, but rather have only a few plants, if the room is limited, than too many for the space. Large plants in 10-in. or 11-in. pots ought to be at least 2 ft. 6 in. apart in a row, and if more than one row these should be 3 feet apart, and, if possible, more. For unless the growth is made under these conditions, and so well ripened or matured, you will have but a few poor flowers, or perhaps none at all.

Stopping the Shoots, &c.—When the young plants, which should only have one stem, are 6 in. or 8 in. high, pinch out the top, so as to induce the formation of three or four side shoots. Do not do this immediately before or after a potting, but wait until the plant has become well established in its pot (we generally do this when in the 3-in.), then take out only just the extreme point, giving rather less water and air until it has "broken" well, and then more again; and when the young shoots are 1 in. or 1½ in. long, shift into the next size. Remember to keep rather drier and a little closer after each shift for a little while, until the roots

are working freely in the fresh soil. The points of the shoots may be pinched out as often as they attain such a length, at the third joint, up to the middle or end of July, if you want to make the plants very bushy; but bear in mind that five or six stems are quite enough for a 9 or 10-in. pot to carry, so that, in general, twice stopping will be sufficient; also, that the less the plants are pinched, and the longer and taller the individual shoots have grown by blooming time, the larger and finer will be the flowers, though there will, of course, be fewer of them than if the plants had been pinched oftener. So that if you want dwarf, bushy plants, with plenty of flowers upon them, without so much regard to quality, pinch often; but if, on the contrary, you aim at getting a few fine flowers, and do not mind the plants being tall, only stop once—or not at all.

Watering.—Give plenty of water in all stages of growth; these plants should never be allowed to flag, and syringe or sprinkle overhead once or twice every day in bright weather, morning and evening being the best times. Manure water is not needed, if the soil is tolerably rich, until the flower buds appear, though some give it as soon as the flowering pots are full of roots; and if the plants appear to need it at this stage give some, but not before the pots are well filled with roots. Give the manure water, which may be a decoction of fresh horse or cow dung, guano water, or anything suitable, alternately with clear water. Begin with it weak, and by degrees increase the strength to a moderate extent, as Chrysanthemums are gross feeders; reduce the strength, however, again as the days get shorter, in October, and discontinue it altogether when the flowers open. In all operations bear in mind that to produce fine flowers the plants must have made a strong and healthy growth previously.

Thinning the Buds.—When large enough to get hold of, thin the flower buds to two or three, or even one, on each stem, if you want extra fine blooms, for you cannot have quality and quantity at once. As soon as there is any danger of frost, or when the air gets dull and dirty, remove the plants under cover. A light, airy greenhouse, with little or no fire heat, is the best place, but a few spare frame lights, fixed sloping against a wall, 4 ft. or 5 ft. from the ground, or high enough to take the plants nicely, or even calico strained tight on a framework, for the top, and boards, old sacks, canvas, or anything fixed along the front, will make a suitable shelter, as before advised. Of course a light sitting-room window will take a few small plants, but

beware of gas in the room—if used the flowers will never open.

Treated as above directed, some of the earlier kinds will begin to open early in November, or even the end of October, and the flowers, either cut and placed in water, in which they will last for weeks, especially if covered with a bell-glass or shade, or left on the plants, will delight yourself and your friends for a long time; and if a suitable selection is made, and some of the Japanese kinds are included, you will not want for flowers till the end of January or later.

The directions given above apply equally well to the cultivation of the Japanese and Anemone kinds, as well as the Pompon and Incurred varieties, all requiring almost exactly the same treatment, the only difference being that the Pompoms do not need such large pots in which to flower as the larger kinds, and the late Japanese kinds need not be quite so forward as the others.

Of course when plants in pots are removed under protection they may be stood much closer together than when growing; indeed they will not hurt touching each other. This is one great advantage of growing in pots, as they may be grown with as much space, and packed as close when in flower, as you please; whereas those in beds must stay as they are. It is a good plan, if there is a south wall, to plant good Chrysanthemums close at the foot of it, and nail them up against the wall like a creeper. In this way they grow very well, and can easily be protected.

Clematis.—These will not do much good in very confined or smoky districts, but in any moderate-sized town or healthy suburb succeed well. Those which will be found to succeed best are *C. Jackmanni* and its varieties, *C. montana*, and those of the graveolens and viticella types; even these will sometimes need a good deal of patience at first, as they are occasionally slow in getting established, and until they obtain a good hold of the soil will not make much growth. A sunny situation should be chosen, and any good soil, preferably loam, moderately rich, will suit them.

Cineraria maritima and candidissima.—This plant is very useful for the flower garden. It seems to do better in town air than any other white or silvered-leaved plant, though the elegant *Centaurea* will do fairly, with care. It should be treated as an annual—i.e., sown early in spring, in boxes of light soil, pricked off, and planted out at the end of May. There is no necessity to pot these plants, and a very gentle heat just to germinate the seed,

and while the plants are young, is sufficient. It is a strong rooting plant, and likes a rather loamy soil, more so than the Golden Feather, or Pyrethrum, which requires similar treatment. Cuttings may be taken in autumn, and preserved in a cold frame through the winter. Old plants are much whiter in the hue of the foliage than young ones, but as the winter always kills these, the only way to keep them is to pot carefully, and give the protection of a cool greenhouse, or a well-protected cold frame. But it is hardly possible to find room for many plants in such places; however, a few may be tried, as a fine old plant makes the best possible centre for a bed of scarlet geraniums. The variety *candidissima* is much more effective than the type. *C. acanthæfolia* is also very effective.

Dahlias.—The Dahlia is so easily grown, and blooms so well even in densely-populated towns, that if there is room a few plants should always be grown. They look especially well at the back of a mixed border of flowers, but they do best in open beds.

Culture.—This is very simple. Procure as many young plants as you require about the end of May; good named varieties (spring-struck cuttings) can be purchased for 3s. or 4s. per dozen. They are usually in small 3-in. pots, and are quite as good as older plants for ordinary purposes. Dig the ground for them deeply and well, working in a quantity of manure, especially at the bottom, and when settled set the plants in their places, pressing the soil firmly round them, and tie each one to a small stake, as they are easily broken by wind. They should have a sunny position, and beyond replacing the small stake by one 3 ft. or 4 ft. long when the plants get large enough to need it, and giving a good soaking of water and liquid manure occasionally, in dry weather, they will need but little attention. There is seldom any need to pinch out the tops, as most of the varieties will branch out quite naturally if in an open and airy situation. They should be frequently syringed overhead, or have a good shower from a watering-pot to keep the foliage clean. Always prefer the syringe if you have one, as the water is driven more forcibly against the surface of the plant, and this brings dirt and dust off more effectually. When the foliage has become dirty we find it a good plan to give the plants a gentle shower over in the evening when the sun has set, just to damp and loosen the dirt, and then come round again in a quarter or a half an hour and give a thorough syringing to wash it off. The

plants will produce numbers of beautiful flowers in August and September, and we have even cut good blossoms in November, not far from London Bridge.

Lifting and Storing.—As soon as the tops are cut down by frost, and the roots well ripened, but before the ground gets frozen, cut off the stems down to the ground; take up the roots carefully, so as not to injure the embryo roots round the collar of the plants, dry them gently for a few days, and then pack them in sand, light dry soil, or cocoanut fibre, in pots or boxes, and stow away in a cellar or other place where they will be safe from frost. They will hardly need any water through the winter, but must not get so dry as to shrivel.

Propagating.—In spring the old roots may be planted, as soon as all danger of frost is over, as they are, in which case they will make fine bushes, or each tuber may be taken off with an eye or two, potted, and started in a gentle heat. But the best way to increase the stock, if required to do so, is to remove the roots, just as they are in the pots or boxes, to a warm greenhouse in February or March, give a little water as they begin to grow, and as soon as the young shoots that spring up round the stem get 3 in. long take them off with a sharp knife, put each singly into 3-in. or $3\frac{1}{2}$ -in. pots, or four or five round a large one in very light and sandy soil, and place them in a gentle hot-bed of 65° or 70° , keeping close. Here they will readily strike root, when they may be hardened off and planted out as before directed. Where extra fine plants are required, shift them as soon as well rooted in the small pots to others 5 in. or 6 in. across, place in a cold frame early in May, and plant out from these.

Single Dahlias are very handsome, and now very much grown. The treatment is exactly similar to that for the double kinds. Vigorous growers bearing fine flowers are—Paragon, deep maroon; Cervantesii, orange scarlet; Aurantiaca, orange; Lutea, yellow; Coccinea, scarlet; dwarfer kinds, with small flowers, very pretty and good for cutting—Glabra, white, Scarlet Dwarf, Yellow Dwarf, Yellow Gem, and Scarlet Gem; these grow only 2 to $2\frac{1}{2}$ ft. in height; the others reach 4 or 5 ft.

Delphiniums are splendid plants for mixed borders, or beds on a lawn. A good rich holding loam suits them best: they never do really well in a hot dry soil. Sow seed in cold frames in July or August, and plant out in deep rich soil as early in spring as possible, or sow in January or February in a gentle heat, grow on, and plant out as soon as possible.

They will bloom the same autumn if kept growing fast. *Formosum*, *Elatum*, *Grandiforum*, and *Chinense* are all good kinds. If left undisturbed the old tubers will come up every spring, and afford a good display.

Dielytra spectabilis.—This is a very handsome plant with long drooping sprays of curious shell-like flowers of a beautiful pink colour; there is also a white variety (*D. s. alba*). The culture is simple; the tubers merely require planting in any good garden soil, in either a partially shaded or sunny situation—autumn is the best time. The young shoots appear in spring, and except staking to prevent breakage by wind, little attention is required. Large roots may be divided and replanted in autumn, and strong roots may be taken up and potted in good fibrous loam, when they will make beautiful specimens in early spring either in a greenhouse or sitting room. Height about 2 ft.

Digitalis (Foxglove).—Very showy hardy perennials, though they may be treated as annuals, (see page 6). Some of the new spotted kinds, as well as the white and other delicate colours are very beautiful. A packet of good seed will afford a great diversity of colour. A rich loamy soil, rather damp, and either a sunny or partially shaded situation will suit them. They do not do well in very confined places, but for most gardens are very desirable.

Evening Primrose (Enothera).—One of the best of town flowers, thriving wonderfully even in the worst situations. All the varieties do best in a light, well-drained soil, as if at all damp or retentive, they suffer much during the winter season. The common Evening Primrose (*Œ. biennis*) is the only one that can be thus designated correctly, as nearly if not quite all the others open their blooms in the daytime, whereas this one expands its large yellow flowers quite suddenly, like the unfolding of an umbrella, between seven and eight o'clock, or thereabouts, on fine summer evenings. There are a large number of varieties, of which the following are the most desirable :—

<i>Œ. acaulis</i> (pearly-white, plants only 6 in. high, rather delicate)	<i>Œ. grandiflora</i> (very large blooms, 4 ft.)
<i>Œ. biennis</i> (common yellow, very hardy)	<i>Œ. Lamarckiana</i> (a very free flowering tall variety)
<i>Œ. Drummondii</i> (yellow, about 1 ft. in height)	<i>Œ. Missouriensis</i> (height 2 ft., flowers yellow, large and fine, makes a good bedding plant)
" " <i>alba</i> (a white form of the same, very free)	<i>Œ. speciosa</i> (fine)

Œ. Fraseri (about 18 in. high, very large rich yellow flowers, and the most robust and vigorous of all)

Œ. taraxacifolia (biennial, 6 in. high, yellow)

alba (do., white)

Most of the *Œnotheras* do well on rockwork.

Propagation is best effected by seeds, which may be sown at almost any time; they are sure to come up, and the plants may either be transplanted or thinned out and left for blooming. Perhaps the best time to sow (out-doors) is the early spring, as even if the plants do not bloom the same year they will be strong enough to stand the winter well. A sunny situation is requisite.

Everlasting Pea.—A fine plant for walls, trellis, or any position where it can have a little support. It dies quite down in the winter, reappearing in spring: quite hardy. Seeds may be sown, cuttings taken, or the roots divided. The common one is of a deep pink colour, but there are also white and crimson forms. A fine kind is *grandiflorus*, which bears very large pink and purple flowers in pairs, and grows like a weed.

Fuchsias.—Few of these will do much good out of doors where the air is at all bad. The best kinds are Daniel Lambert and Mrs. Marshall: these will succeed if any. A rich, well drained soil and rather shady spot suits them best. The old *F. gracilis* and *Riccartoni* drop all the buds before expanding in town air, so are useless.

Geraniums are always useful. The best scarlet for bedding and ordinary purposes is still Vesuvius, though Improvement and West Brighton Gem have some points in advance, but these have not as yet had sufficient trial to show whether or not they are better for massing. Good crimsons are Edward Sutton, Rev. A. Atkinson, and Corsair; Commander-in-Chief is grand for good-sized beds. Master Christine and Mrs. Turner are good pinks, but these are now eclipsed by Newland's Mary, a wonderfully profuse bloomer, with immense trusses of a rich rose-pink, which continue in good condition a long time. We consider White Vesuvius to be the best white for bedding, though White Clipper is also good. Of gold and bronze kinds, Black Douglas, Marshal McMahon, and Emperor of Brazil, are the best; and of silver variegated, Brilliantissima, Flower of Spring, and Mrs. Mappin; the two last are identical in foliage, but the latter has white, and the former rosy scarlet, flowers. These will require care to make a good display, as they are not *so vigorous* as the scarlet and flowering kinds, while the

gold and silver Tricolors will hardly ever succeed except on the outskirts of a city. Autumn struck cuttings of all kinds should always be employed for bedding. They will root freely in August, either in pots or boxes in a cold frame, or if inserted early, not later than the first week of this month, will do well in the open air (*see page 128*). But as cuttings can rarely be obtained in sufficient quantities for bedding, about the best plan is to have boxes made, each about 18 in. long, 9 in. wide, and 3 or 4 in. deep, with a few holes in the bottom. Put a few crocks into each for drainage, a little rough soil over these, and fill up with any free, open, and somewhat granular loamy soil, containing a fair allowance of sand. Such a box will hold from three to six dozen of cuttings, according to size. Press the cuttings in firmly, give a good watering to settle them, and place in a sunny frame, where they will quickly root; do not keep very close, and as soon as well rooted expose to sun and air as much as possible. Cuttings may thus be taken up to the end of September, though the earlier the better. A light airy greenhouse, with temperature 40° to 50°, is the best place to winter them; pot off and harden in spring. If only a few plants are needed, insert the cuttings in 3-in. pots, three or four in each, and treat as above. If you cannot give them a little heat, or keep close for a time after potting, do not pot off singly till March. They should be kept dryish through the winter. Plant out the last week in May, in soil approaching as nearly as possible to a good sandy loam, not too rich. If, to suit other things, the soil in the beds is rich, it would be better to have the plants in large sixty's or forty-eight's, and plunge them in the beds, to check an over-luxuriant growth, which would otherwise take place and be prejudicial to a free bloom.

Golden Feather (*see Pyrethrum*, page 74).

Gladioli make a fine show, and will do in all but the very worst localities. The soil must, however, be suitable, as the extremes of a too light and rubbishy soil, or a too heavy and retentive one, are both injurious. The best is a free loam, rather peaty, with a small admixture of leaf-soil or well decayed manure, and some sand or coarse grit if the soil is at all heavy. The beds *must* be well drained. Plant in March or April, 3 or 4 in. deep, and stake as they grow. If the soil is light, warm and thoroughly drained, they may be left out all the winter, but it is safer to take up as soon as the foliage dies off, dry, and store in paper-bags in a dry place till planting-time comes round again. There is now

such an immense variety that it would be almost useless to give any names, but any good firm would supply a good selection at from a couple of shillings to two pounds or more per dozen.

Godetia is a pretty annual of which there are many varieties. *Rosea-alba*, *Whitneyi*, and *Lady Albemarle* are good. Treat as hardy annuals, affording a sunny position.

Hollyhocks are great favourites with many, and justly so. Nothing looks better than the spikes of these interspersed among tall growing subjects at the back of a herbaceous border. Many of the old-named kinds have been lost through the Hollyhock disease, which has destroyed whole collections in late years. Seedlings make the healthiest plants, which are more likely to resist any attacks of disease. Sow in a bed where you can put a frame over the young plants any time in August or September, or sow earlier and pot off in 5-inch pots for wintering in cold frames; or else sow in gentle heat in January or February, prick off, plant out and grow on quickly to flower in autumn. Last year's plants should be put out in April or even May. The soil should be deeply dug and well manured, and a partially shaded position is best. Cuttings may be taken of good sorts that have flowered early, or eyes may be taken off and inserted in sandy soil in gentle heat. Of course seedlings will not all come double, or good flowers, so take care of a good sort when you get it.

Hyacinths make a fine show with little trouble, though rather expensive, as they will not produce good spikes after the first, or at farthest, second year. They like a rich soil, rather loose in texture, with plenty of rotted manure, or leaf-mould, or both, worked in, with some sand. Plant in November out of doors, and cover the beds with a layer of sifted ashes. Remove these in spring, taking care not to injure the rising crowns, prick up the surface of the soil, and put a layer of leaf-mould or coconut fibre on the bed. A sheltered position should be chosen, and if you can rig up a light framework, over which calico may be stretched in case of severe weather coming just as the blooms are rising or expanding, you will have a much better show than if left exposed: Old bulbs, from either beds or pots, planted in any out-of-the-way corner will often yield small spikes of bloom, very useful for cutting, for years.

Iris.—These are among some of the very best of town flowers. We have had the common German Iris quite as fine in Bermondsey as could possibly be produced anywhere.

Like mignonette, these never come to perfection in a close heavy soil, such as a strong loam or clay. They luxuriate in a free, porous, almost rubbishy well-drained soil, so long as there is sufficient substance and richness in it to retain moisture and feed the plants. The Iris succeeds in either sun or shade, though the Kœmpferii varieties prefer a sunny position, and we think that all, or nearly all, seem to do better thus; though at the same time a constant supply of moisture at the root must be maintained, at least during the whole period of growth and flowering, yet this must not be by any means stagnant, but have free facilities for passing away, or rot is likely to make its appearance. The more delicate kinds should have a peaty soil, in which they will attain the greatest perfection. There are innumerable varieties—too many to enumerate here. Almost the whole of the English, German, and Spanish classes are sure to succeed, and many of the Kœmpferi and sibirica varieties would probably give good results with ordinary care, though we must confess we have only tried a very few of these. As a commencement, such as *I. germanica*, *causcens*, *fotidissima*, *hortense*, *mexicana*, *nudicaulis*, *persica*, *reticulata*, *spectabilis*, *susiana*, and *tuberosa*, might be obtained.

Lilies (Lilium).—Strange as it may appear, many of these universally admired flowers will succeed admirably in the town garden. There is some difference of opinion as to the description of soil most suited to their requirements, but the fact is they will usually succeed in any moderately rich light soil of any description short of clay or a very strong loam. There is no doubt that Lilies do splendidly in beds of peat among Rhododendrons, Azaleas, &c.; again leaf-mould will produce splendid flowers, and some of the finest we have ever seen were growing in strong loam on a clay subsoil, which we should have said was too heavy, yet there they were. On the whole, about the best stuff for the ordinary kinds is a free (not heavy) loam, with a moderate admixture of peat, leaf-soil, or old rotten manure, and a top-dressing or mulching of short, half-rotten dung may be applied in spring, when they begin to start, though this is not by any means absolutely necessary. If they take to the ground at all well do not disturb them, but let the bulbs remain, merely loosening the surface and working in a little leaf-mould or rotten manure each spring. If they like their position and get a good hold of the soil, most kinds will increase very rapidly even in town. We fancy they prefer a situation where the ground in which they grow and the lower part

of the stems is at least partially shaded, while the tops and flowers are exposed to the influence of the light and heat of the sun. The soil should be fairly well drained.

For situations in the heart of large towns, the following kinds are most likely to do well :—*Lilium aurantiacum* or *crocceum*, *bulbiferum*, *candidum* (the common white garden lily) *tigrinum* (and varieties, fl.-pl., *fortunei*, and *splendens*), and perhaps *chalcedonicum*.

For suburbs, or on the outskirts of large cities, and for small towns, the following kinds are suitable, in addition to those named above :—

<i>L. auratum</i>	<i>L. Krameri</i>
<i>Brownii</i>	<i>lancifolium</i>
<i>californicum</i>	<i>Martagon</i> (and vars.)
<i>canadense</i>	<i>pardalinum</i>
<i>carniolicum</i>	<i>parvum</i>
<i>concolor</i>	<i>pomponium</i>
<i>Davuricum</i>	<i>pulchellum</i>
<i>giganteum</i>	<i>szovitzianum</i>
<i>Humboldtii</i>	<i>Thunbergianum</i> .

The Lily of the Valley (*Convallaria*) is to be successfully cultivated in most places, though we have seen it where the air was so bad that the blossoms though formed could not open. This is, however, an exception. A shaded situation protected from cutting winds or draughts (which are very prevalent in town gardens) should be chosen, and if good strong roots are planted firmly in good rich, somewhat friable loam, an annual top-dressing of leaf-mould given, and the plants left undisturbed they should do well.

The Day Lily (*Hemerocallis*) is also a good town plant, with showy orange or yellow flowers. *H. flava* is about the hardiest : it has yellow flowers : but in the suburbs all the varieties would probably succeed.

Helichrysums (Everlasting Flowers).—These are so easily grown, so pretty, and the flowers when dried last so long, that we strongly recommend them. The double dwarf kinds, and especially a variety called "monstrosum," are by far the best ; separate colours can be had if desired. Sow the seed in the first week in April, in equal parts of loam, leaf-mould, and sand, or any light, rich soil, but the compost of course gives the best plants. Cover the pans or boxes with glass, and place in a frame, with gentle heat, if possible, or a window or cold frame, or even a box out of doors covered

with glass will do. When large enough prick out into boxes, or into nursery beds out of doors, and when good sturdy plants, 3 in. or 4 in. high, set out in their places. They may be planted either singly in mixed borders, or will make a fine bed by themselves. We, however, generally put three in a group, triangularly, the plants about 6 in. or 8 in. apart. This makes a pretty group. Give them rich soil and plenty of water if you want fine flowers, yet few things will stand so much drought uninjured. For drying, cut the flowers when just opened, and hang up by the stalks, head downwards, in a sunny window; when thoroughly dry, store away for winter use, or make up into bouquets at once. A few dried Grasses, such as *Stipa pennata* (Feather Grass), *Panicum virgatum* and *fimbriatum*, *Agrostis nebulosa*, *Briza gracilis*, or others, mixed with them, are a great improvement, and if you have not sufficient variety or brilliancy of colour, use Judson's dyes to deepen or contrast them. It is almost needless to say that these dried grasses and flowers must not be placed in water; on the contrary, they must be kept as dry as possible.

Lobelias.—These are so useful for edgings, baskets, window-boxes, and almost numberless purposes of display, that they should be grown by everyone. Great difficulty will be experienced in keeping these through a town winter, and the easiest and best way is to grow them fresh from seed each year. Yet plants from cuttings are undoubtedly more dwarf in habit and flower more profusely than seedlings. The best way is to keep a few good plants well established in pots through the summer, cut them over in autumn, keep airy, and propagate from these by cutting in spring.

Sowing.—Sow the seeds either in autumn or in January or February, as a great mistake is made by some people in sowing so late that they have to be forced rapidly on in heat; while, if they have plenty of time to grow in, they will do far better under cold treatment. Sow in pans or boxes, using a light soil of loam, leaf mould, and sand, in nearly equal parts—the top $\frac{1}{4}$ in. finely shifted. The seed will germinate in any ordinary greenhouse if a sheet of glass is placed over the box, or even a sitting-room window will do. If in a greenhouse the pan should be placed on a sunny shelf, and if a heat of about 60° can be afforded all the better; but the heat must not be continued too long.

Potting.—As soon as they are large enough to handle, or $\frac{1}{2}$ in. to $\frac{3}{4}$ in. in height, prick off into boxes 1 in. or $1\frac{1}{2}$ in.

apart. Keep close, and a little heat would be advisable at this stage, to induce them to root well; then, when strong, either pot singly in small 60-sized pots, or take out every other one and transplant into other boxes or cold frames. Where a large quantity are needed it is advisable to prepare a frame by putting 2 in. or 3 in. of nice light rich soil in the bottom, with a little heating material underneath, just to give them a start, and prick out 2 in. or 3 in. apart into this from the seed-pan. From such beds or boxes they may be planted out where they are to flower, taking them up with good balls of earth, and planting about 6 in. apart in the row. This saves the bother of potting, which is not by any means necessary.

Raising in Windows.—For those who have no convenience of frames or greenhouse, sow the seed, covering with a sheet of glass, as above directed, and keep in the window of a kitchen or sitting-room, and when large enough prick out into boxes covered with glass out of doors. These are very useful in many ways. We find the Swiss milk cases, to be had at any oilman's or grocer's, a very useful size. They are about 20 in. by 14 in., so that two sheets of glass, 14 in. by 20 in., costing about 4*d.*, will cover them nicely. Place them in a warm, sheltered, and sunny place, put 3 in. of broken bricks or ballast, or even ashes, at the bottom, on this an inch or two of spent hops, and fill up to 2 in. or 3 in. of the top with nice fine rich soil. Into this you can prick out Lobelias, Petunias, Verbenas, and many other things quite safely about the middle of April. Keep the glass on closely at first, and as the weather gets warmer, and your plants stronger, expose them more and more till the glass is dispensed with altogether. You have thus a month or six weeks for your things to grow in before planting out, and, being so close to the glass, they will be fine and strong. One of these boxes will contain enough plants to fill a moderate-sized flower-bed. Of the many varieties Blue King, Blue Stone, and Speciosa are about the best, being of dwarf compact habit, and capital colour.

Maize.—The striped Japanese is very useful for bedding. Sow in gentle heat in March, pot off, and plant out in rich soil in May.

Marigolds, though common, are very useful, as they will grow and flower well anywhere. Sow in good soil in sunny place in spring, or the French may be started under glass, as they are not so hardy. The common garden and the

French striped are the most desirable; we do not like the African, it is too coarse in flower and rank in growth.

Marvel of Peru (*Mirabilis Jalapa*).—This makes a well-shaped bush, and no situation is too hot and dry for it to grow in. Sow the seed in March in heat, or out of doors in May, and the plants will bloom the same summer. The old bulbs must be taken up when the stems die down at the approach of winter, and stored in a cellar or other dry place, safe from frost. Old plants that flowered early will frequently be found to have seedlings sprung up around them in the autumn, and if these are carefully taken up and stored away in a little earth they will make good plants for next year. Although they stand drought so well, yet, like all other plants, they will succeed better if planted in rich soil and kept fairly moist.

Mignonette is one of the best annuals—indeed, the best we ever had grew in a town garden. The secret of getting fine Mignonette is in the soil. This should be light and porous, as well as moderately rich: it never does on a damp close subsoil. Afford a sunny situation. Miles' Hybrid Spiral is the best for in or out-door work, but the Pyramidal and Giant Scarlet are very good.

Mimulus (Monkey Flowers).—These should be treated precisely the same as *Lobelias*; give them plenty of water, and as little heat as possible. There are many named kinds now in commerce, but a packet of seed of a good strain will produce as good flowers as any one can wish to see; these plants come very true to colour and shape, &c., from seed. They may be planted out about 6 in. apart in any open border in May. Sandy loam and a somewhat shaded situation suits them best, though they will do better in the full blaze of the sun than in a very shady or gloomy place. The soil need not be rich, and it is astonishing how little soil they will grow in, and, in fact, they flower far better when cramped at the root. About the best place for them is on rock-work, round a fountain in the sun, where they will have plenty of water, sun, and air, and but little earth to grow in.

The **Pansy** can hardly be classed as a good town flower, as we have tried it in all ways in nearly central London, and could not get it to do at all. But for the suburbs and small towns it is very useful. It prefers a shady situation, at least nearly all the show kinds do, though the bedders and many of the fancies, including the whole of the Belgian

blotched kinds, do well in the sun. Named plants that have been much propagated, are apt to be weakly, and often go off. in hot weather. The best plan is to sow seed in a box or pan of sandy loam and leaf-mould in February, and plant out in May. The plants will bloom the same summer. A good loam, with a little rotten manure or leaf-mould, is best. Make the soil firm.

Pentstemons are splendid things, but will not do well in very central localities. Cuttings of the side shoots that do not show for flower may be put in in autumn; they root freely in a cold frame. Keep them through the winter in the frame, potting singly in September or October, if struck early enough—if not, leave till spring. Plant in May in good rich and deeply dug soil, in a sunny situation, and they will flower abundantly from the end of June till October. Seed may be sown in pots or boxes in autumn, or in early spring in a gentle heat. These grown quickly and planted out will usually flower in the autumn. They make the most vigorous plants, and if the seed is of a good strain, many of the flowers will be as good as named kinds. A dozen good ones are—

Alexandra (rosy-purple, white throat)	Montague Corry (bright rosy-carmine)
Blue Boy (purplish-blue)	Miss Little (scarlet, white throat)
Dr. Turner (crimson, white throat)	Pink Perfection (pink)
Edith Box (delicate rose, very pretty)	Robert Lowe (bright blue, white throat)
Egerton Hubbard (dark maroon)	Sir A. Gordon (rosy-crimson)
George Amer (dark purple)	Stanstead Rival (bright scarlet)

These beautiful plants, so much in vogue at one time, are now again becoming favourites.

Petunias.—We think it a great pity that these showy plants are not more generally cultivated. One often meets with people—and people who are fond of their gardens too—who do not know what Petunias are. They would not think the garden complete without a bed of Verbenas, and though universally admired, when they are seen, no one seems to think of growing Petunias. Yet the flowers are of great size, a single bloom usually being larger than a whole truss of Verbenas, the colours are unequalled, the markings are found of almost unlimited variety, and the plants themselves are extremely easy to grow, and will often succeed well in soils totally unfit for Verbenas. A bed of mixed colours is

extremely effective, and in this case seedlings may be used, and for general purposes these are preferable to plants from cuttings, as they are more easily grown and much more vigorous.

From Cuttings.—If separate colours must be had, cuttings must be taken. Strike them early, in July or August, and label them carefully, as the effect of a bed is often lost through getting the varieties mixed up. They will strike easily in a cold frame, kept close. When rooted, pot off singly in 3½-in. pots. These should be kept through the winter in a light airy greenhouse, if possible, or in a sunny window of a warm room. Keep them slowly growing, if possible, and pinch out the tops, so as to have a nice lot of young shoots about 3 in. long by March, or whenever you can strike them. When your hotbed is about 70°, and nice and sweet, take off the cuttings, trim them, and insert five or six round the sides of a 3 in. or 3½-in. pot, using loam, leaf-mould, and sand in equal parts; give them a sprinkle, then stand aside till dry, and place in the frame; give only a little air till struck, then increase the quantity, and when a little hardened pot off singly in 3-in. pots, using light loam with a little leaf-mould and sand. Keep close a few days, then harden off gradually; plant out the last week in May. Soil—almost anything will do, and it need not be very rich, as the plants are robust growers generally. They do best in a light soil, and when well-established need but little water at the root; though in towns it is advisable to give them a fair amount of manure, and also a good showering overhead morning and evening, to keep the foliage clean, and do not let them get very dry at the root. The plants may be either trained upright on sticks, pinched in so as to form a compact bush, or pegged down like Verbenas.

From Seed.—For mixed beds seedlings are best; get a packet of seed of a good strain, and sow either in September without heat, and prick off into store pots or boxes for the winter, or sow in a gentle heat in February or March, say 60° or 65°, or simply in the greenhouse; or a sunny window will do after the end of March, covering the pot or pan with a sheet of glass till the seedlings are up. Early sown seed makes the best plants. The best soil for seed-sowing is leaf-mould and sand, with the surface sifted fine, and a little loam in the rougher stuff below. As soon as it is possible, prick off the seedlings singly in boxes, about 2 in. apart, and they would be the better of a gentle heat at this stage to

induce them to root freely, and if at all late to make growth. In any case the boxes must be kept close for a few days, then admit air, and when the plants touch each other pot off singly in 3-in. pots, harden off, and plant out as before directed. Or if they are pricked out or transplanted to 3 in. apart in boxes instead of 2 in. and have $2\frac{1}{2}$ in., or 3 in. of soil, the potting may be dispensed with, and the plants taken up with good balls, and put direct out into the beds.

Single varieties of Petunias should always be used for beds, as, though the double ones are very fine, the rain spoils the blooms, so that they should be kept for pots indoors.

Phlox Drummondii.—This is another extremely valuable town flower. Its colours surpass even the Verbena in brilliancy, and the trusses are much larger. The new grandiflora varieties far surpass the older ones in the size of both plant and flower; but they are somewhat taller and more straggling in growth, and we fancy they do not bloom quite so freely. Sow the seed in light rich soil in gentle heat in March; cold frames early in April, or at the end of April out of doors. The plants do as well or better, becoming more robust and dwarf when sown out of doors than by the other method; but as they are slow in making a start, the season is rather far advanced before they come into bloom. So that, where it is possible to do so, it is better to sow under glass, in a greenhouse, frame, or warm window, as for other half-hardy things; prick off singly in boxes, 2 in. apart, when ready, and plant out 8 in. or 10 in. apart in good rich soil. The plants may, if early enough, be potted singly when pretty well advanced, and when well rooted out, be planted from these into the beds and borders; in this way the roots do not get injured, as they sometimes do, if left too long in boxes. If good fresh seed can be had, and the plants are grown with plenty of room, air, and light, they will be so strong that they will shoot out laterally at the base, and may be pegged down like Verbenas; but if at all weak they will leave only a single stem, and had better be planted rather close, and tied up to neat stakes. Like all other annuals, these delight in a good deep rich soil in which to grow, and it should be light rather than heavy in texture. They need plenty of sun to do well.

The perennial Phloxes are extremely showy and useful, and will succeed well in most places. They have been much

improved of late years. The culture is of the simplest; strong young plants should be planted in April or May in a border of deep rich soil, and they will merely require staking and tying to prevent breakage, though watering in very dry weather and an occasional dose of good liquid manure will be highly beneficial, especially when the flower buds show. Use the syringe over them freely on the evenings of hot days. The old plants will stand and bloom for years, and will annually increase in size, but two-year old plants produce the finest blooms. To obtain these take young shoots as soon as they are 3 in. long in spring. They will strike as easily as Chrysanthemums in a frame, and may either be planted out or grown in pots. A dozen good kinds are—

Auber (lilac and rose)	Mdlle. M. Saison (white shaded red)
Boule de Feu (fiery-red)	Mr. W. Bull (lilac, white eye)
Countess of Eglinton (deep rose, carmine eye)	Mrs. Black (silver-peach)
Earl of Mar (rosy-scarlet)	Rochambeau (deep violet)
George Grieve (rosy-salmon)	Snowdon (white, pink eye)
John Laing (purple-crimson)	The Queen (the finest white)

If grown in pots they should be kept well supplied with water and liquid manure.

Pinks (Indian and Japanese).—Hardly anything will be found to stand the smoke and dirt of towns so well as these. Though really perennials, and having the power of being perpetuated by cuttings, they are better raised from seed every year, as even if they would stand the winter they always look very straggling and untidy the next year, but this trying season nearly always proves fatal to them. If you have a frame and want early blooms, sow the seed in boxes of loam, leaf-mould, and sand in March, and prick off and plant out as soon as large enough; a gentle heat will cause the seed to germinate more quickly and freely if early in the season, but they will do very well in a cold frame early in April. They may, however, be sown out of doors in April either in nursery beds or where they are wanted to flower, with almost as good results as by the more troublesome method. Of course they will not bloom quite so early in this case, but the difference will not be much. Do not buy, as a rule, cheap packets of seed, but go to a good shop and do not grudge 6d. or 1s. for it. The best double Indian Pinks should be obtained, and some of the finest

flowers come from the *Dianthus Heddewigi* and *diadematus* classes. The Chinese or Japanese Pinks are single, and the new Eastern Queen and Crimson Belle, sent out by Messrs. Carter, are extremely beautiful. Indeed, in our opinion nothing can surpass these last for effect in bedding. They should be treated exactly in the same manner as the Indian Pinks; plant out 6 in. or 8 in. apart, as they will not grow quite so freely as in the country, and tie up the flower-stems to neat stakes. All should have a rich soil; good loam enriched with some well-rotted manure is about the best. Give them a sunny situation.

Paeonies.—Very handsome herbaceous plants, with large showy blooms, colours varying from pure white to deep crimson. They only need planting in deep, very rich soil to be watered in dry weather, and have a top-dressing of manure yearly, as they are gross feeders.

Poppies (Papaver).—Of these there are both annual and perennial varieties. Vigorous growing kinds of either are adapted for town culture. Of perennials perhaps *bractatum*, *nudicaule*, and *umbrosum* are most desirable; *Marshalli splendens* is also fine, but hardly so vigorous. Any of the annual kinds, preferably doubles, are suitable. A rubbishy soil seems to suit these, if it is rich enough, and a sunny situation should be chosen.

Pyrethrums.—There are now two distinct classes of this plant, both of which are almost equally suitable for the town garden. The first is the Golden Feather, or Fever-few, grown only for its elegant yellow foliage, and now so largely used in bedding out. The other class is grown for its flowers, which are very bright in colour and showy. This grows to a height of 2 ft. or more, and is treated as a herbaceous perennial. There are many named varieties now to be purchased. The Golden Feather should always be treated as an annual. Sow the seed in light soil in March or earlier, in a little heat if you can. Prick out 1½ in. apart in boxes, and grow on in cold frames or under glass. Plant out at the end of May from 4 in. to 8 in. apart; 6 in. is a good medium. It will grow in almost any soil that is light and rich; while young, boxes filled with spent hops in a decayed state suit it admirably. When in the beds, keep all blooms picked off as they show, for they are anything but pretty, and take the colour out of the leaves. The flowering Pyrethrums should be purchased in spring, as roots; the

price is from 6s. to 8s. per dozen for good-named kinds. A good selection of varied kinds would be—

<i>Andromeda</i> (lilac-rose)	<i>Le Dante</i> (shining-rose)
<i>Aurora</i> (creamy-white)	<i>Michael Buckner</i> (rich rosy-crimson)
<i>Brilliant</i> (rosy-purple)	
<i>Candidum plenum</i> (white)	<i>Niveum plenum</i> (pure white, very double)
<i>Delicatissimum</i> (bright rosy-lilac)	<i>Roseum plenum</i> (rosy-blush)
<i>Emile Lemoine</i> (purplish-crimson)	<i>Solfaterre</i> (sulphur, golden centre)
<i>Fulgens plenissimum</i> (rich carmine)	

These are very useful for cut flowers. Give them a deep, rich, well manured soil and plenty of water, and they are sure to do well. When the flowers are dead, cut down the stems and cover with litter to protect the plants from frost. In very bad situations it would perhaps be better to divide the plants in autumn and keep them in a cold frame, otherwise do not disturb them till spring.

Ricinus (The Castor Oil Plant.)—These have large and handsome foliage, and being of stately habit, are much used in subtropical and ornamental gardening. They are tender annuals, and the seed should be sown in a moderate heat in February or March; pot off singly as soon as one proper leaf is formed, using a light very rich soil. Grow on in gentle warmth, harden off, and plant out the first week in June in deep light soil, which cannot be too rich. Stake and water freely. In a warm protected situation they will grow 5 or 6 ft. high. If early they should be shifted once or twice, so as not to get them at all stunted.

Salpiglossis.—Beautiful annuals, with veined flowers of various shades and colours, varying from yellow through crimson and purple to nearly black. Sow under glass, in gentle heat in March, or cold frame in April, prick off and plant out in light rich soil and sunny situation. In a good season seed sown out of doors, where it is to flower, the first week in May, and thinned out, will germinate and make good plants. Height about 2 ft.

Saxifrages.—Some of the stronger growing kinds of these are among the best of town plants. They are of dwarf growth, and admirably adapted for forming clumps or carpets under trees, in shade, or in several positions where most things will often not grow. They will do in any fairly good soil, preferably loamy, but the drainage should be good. As before stated, they prefer a shady or partially shaded situation. Being evergreens, with very bold and handsome green or bronzy tinted foliage, they are very desirable as affording

a pleasant object for the eye to rest upon even in winter. When once planted, if they seem inclined to do well, and become established, do not disturb the roots, but allow them to extend, as they will be sure to do, to as large a size as is allowable. The best are *S. crassifolia* with almost circular leaves, and spikes of bright pink or rosy flowers in early spring; *S. ligulata*, also with rosy white flowers, and very similar. Of this there are varieties *rubra* and *speciosa*, and of the former there are *S. media*, *sibirica*, and *aureo-marmoratis*. *S. ligulata* has the leaves edged with white. These two, with their varieties, are almost certain to do well anywhere; but the following will also succeed in most places, and are very desirable:—*S. affinis*, *aizoon*, *cristata*, *intacta*, *intermedia*, *longifolia*, *oppositifolia*, and *recta*. These are of smaller growth, suitable for edgings of beds, &c. Other fine large leaved sorts are:—*atropurpurea*, *Burseriana*, *ceratophylla*, *hypnoidea*, *peltata*, *pyramidalis*, *umbrosa*, and *Wallacei*. *S. purpurascens* and *Stracheyi* are beautiful new sorts, with large leaves.

Snapdragons (Antirrhinums).—These should be sown early in spring and treated as annuals, as they do not stand the winter well. Sow in February or March in a gentle heat or sunny window, using light loamy soil. Prick off into boxes, and plant out in May. If sown any time in March, and kept growing, all will flower the same year, but the earlier they are started the better.

Stocks.—These sweet and beautiful flowers succeed so well in the town garden that they should be grown by everyone. Nothing seems to stand the dirt and smoke so well. There are many varieties, but for ordinary display the German or Ten-week will be found most useful. These are annuals, and bloom throughout the summer. The light soil usually found in town gardens suit Stocks admirably, as they do not like a damp, heavy, or close soil, and never attain any size in such. They are extremely fond of lime or mortar rubbish, crushed fine, but though the soil is light, it must be rich as well to suit them, so work in a quantity of well-decayed manure when preparing the beds, and dig deeply.

Sowing.—The seeds of the annual kinds should be sown as early as possible, as the longer time the plants have in which to grow before coming into flower the finer will be both plants and bloom. Do not forget this, as it is a most important point. Seed may be purchased in many different colours, and if sown and kept separately, one or more fine parti-coloured beds may be had; but in most cases a packet

of mixed seed, costing 6d. or 1s., will suffice, and many dozens of plants may be raised from such a packet. The best soil for seed sowing is about equal parts of loam, leaf-mould, and sand, rather less of the latter, perhaps. The pot or box must have plenty of broken bricks or crocks for drainage, as if this point is not carefully attended to, the plants are very apt to go off just at the surface of the soil, especially in the early part of the season. On this place a thin layer of moss or spent hops, and then place the soil, sow the seed thinly; to this end wide boxes are better than pots. When sown early, a frame with a gentle heat of 60° is the best place for the seed-pan, but a greenhouse or sunny window will do, and by the end of March it will be safe to sow in a cold frame; but always sow early if you can. Keep the box close to the glass and in as much light as possible after the seedlings are well up, though, while young, they must be shaded from hot sun.

Transplanting.—When the young plants get the second pair of leaves, prick out into boxes in cold frames or protected beds in good rich soil (two parts loam, and one part each of leaf-soil and old rotten manure with some coarse sand is best now) about 2 in. or 3 in. apart. Here they may remain until it is time to plant them out. This should be carefully done; choose cloudy weather if you can, as they are very apt to flag badly in sunshine after replanting. Give them a thorough soaking an hour or two before removing them, and take up singly with as much soil round the roots as you can get, and loosening or disturbing the same as little as possible. Plant 8 in. or 10 in. apart, pressing the soil firmly about the roots; give another good watering, and if the sun shines hot and strong within a few days afterward, they must be shaded. In planting discard all the extra tall and strong growers; these will generally be found to have long, coarse, and forked roots instead of a nice tuft of fibrous ones; such plants always turn out single flowers, whereas the aim of the gardener is to have only double ones. These are mostly rather small and compact growers, and such only should be planted. It is the practice of some to leave the plants growing in not much soil, and rather cramped at the roots in pots or shallow boxes until the flower-buds show, when they can easily be distinguished, the single ones having long pointed buds, with four equidistant cracks or marks down the sides, and the double ones full, round, crumpled-looking buds. This is a very good plan, though the plants may suffer a little by being cramped and removed after the

flower-buds show, a thing always to be avoided with nearly everything, but we have known very fine plants that were so treated; to avoid injury as far as possible, put the plants in their places as soon as ever the difference in the buds can be seen.

Situation.—The bed for Stocks should have an open and airy position, exposed to the full power of the sun. The plants should be plentifully watered in dry weather, especially when coming into bloom, and each should be supported by a neat stake to prevent its being blown about by winds. Treated thus, German Stocks are, in June and July, a sight not often seen.

Virginian Stocks.—Where there are no conveniences for early sowing under protection, the Virginian Stocks are useful; these are hardy annuals, and may be sown out of doors in March or April. But these are not nearly so fine as the German; in fact, not to be compared with them. Ten-week Stocks may be sown out of doors in protected nursery beds at the end of March, but, like the German, they are the better for a little care and early sowing.

The Intermediate Stock.—This is a great favourite, and produces larger heads of bloom than the German, and is biennial. The seed should be sown exactly the same as described above, but in August or September, and the plants should be pricked off and potted singly if possible, and kept through the winter in a cold frame, then planted out in spring. These should be put wider apart, as they are larger growers. If sown early in spring these will flower in the autumn. The Emperor and Queen Stocks are perennials; they are very fine, but a town winter generally kills them. The Brompton Stocks, too, are fine; they are biennials, like the intermediate.

Sunflowers.—We cannot say that these are at all beautiful, but they are very effective, in a manner, and what is more, they will grow and do anywhere. They will, of course, grow and flower much finer in a deep and rich soil than in a poor one, for they are terribly greedy things, and can scarcely be overfed. Sow the seed out of doors in March or April, thin out, and transplant if needful. We used to have these and Marigolds come up all over the place by thousands in spring, self sown, and where they have once got a start they will do the same; and these self-sown plants always do better than any others.

The secret of growing fine Sunflowers is to give them a very deep, loose and well drained, but yet very rich soil, in

which their roots can penetrate to almost any depth. They cannot flourish in a shallow soil, on a cold or clay bottom. The more sun and water they get the better.

Verbenas are too well known to need comment. It is difficult, if not impossible, to keep these through the winter in a town, the only way being to get a few strong cuttings struck early, and potted off singly, and well established before winter. The shoots produced by these are taken off in spring and struck in heat. Old plants taken up from the borders inevitably die, and pots or boxes of young cuttings taken in September, as is usually done, generally perish also; so that you must either get a few strong young plants in 5-in. pots to keep through the cold weather and take cuttings from in the spring, or purchase afresh every year. If the former plan is followed, the cuttings should be growing when taken off, about 3 in. long, and March or the early part of April is the best time. Put them pretty thickly in light soil in pots or boxes (leaf-mould and sand rather rough is as good as anything for soil), and place in a gentle, sweet hotbed of about 70°. When rooted, admit air, and pot off singly when ready; or they may be planted 3 in. apart in cold frames or pits, with a glass or calico covering, and be left there to harden till planting out time. But, unless when distinct colours must be had, and if a little heat can be applied, we recommend the use of seedlings, as they are, when well grown, so much more vigorous in growth and flower than plants from cuttings. Get a packet of mixed hybridized seed from a good firm, and sow it as early as possible; if later than the middle of March, the plants will be behind the other bedding things. Sow thinly in well-drained boxes, using leaf-mould and sand in rather a rough state, not sifted, only lumps picked out, and left loose and rough on the top. Place in a good bottom heat of 70° or 75°, and keep close till the seeds have germinated; they must then be placed close to the light, not be over-watered, and have a fair supply of fresh air. As soon as the plants form the second pair of rough leaves, pinch out the points beyond, and when they shoot again prick off singly. It is better if they can still have a little heat, though they will do at this stage, if pretty strong, in a cold frame. Keep close for a few days, and then admit plenty of air. Plant out where required in May. They would do rather better if potted separately when fit, and grown on till planting time in small 3-in. pots. These plants are rather particular as to soil, and will not do well in a damp, cold, and heavy material. They delight in a free, rich,

light soil, into which their long, delicate, and fibrous roots can easily penetrate, so that the best material they could have would be a light, sandy, and peaty loam, mixed with a good proportion of leaf-mould and some old manure. If you cannot get peaty loam, mix one-third or half of good sandy peat with it. The bed should be deep, at least 18 in., and well drained. But good Verbenas can be grown in any wholesome light soil if it is enriched with plenty of leaf soil or well rotted manure. From 1 ft. to 18 in. is quite close enough for strong plants, and when they begin to grow the shoots should be well pegged down with hairpins or hooked twigs regularly, so as to cover the beds with an even mass of foliage and flowers. Thus treated, we have had beds of Verbenas in which not an inch of soil was to be seen, all one carpet of rich green leaves, and the foliage in turn almost hidden with immense trusses of flowers; and any one can do the same. A great deal has been said and written about Verbenas in pots, but they are a great deal of bother, and do not grow half as well as in beds, at least that is our experience, and in a town especially we know they will not do any good in this way.

Zinnias.—These are now far superior to what they were some years ago. They are now really handsome flowers, especially the double ones, and the colours, though not brilliant, are glowing and intense. Sow in March or the first week in April in a good, rich, light soil, and place the box either in a cold frame or very gentle heat. Prick off singly and pot when fit, the main thing being never to let the plants receive a check in any way. Do not over-water, as they are liable to damp off at the collar. Plant out in May in deep rich soil, and when they grow, tie up to neat stakes. They must have a sunny situation. These have one great advantage over most other annuals—viz., that the flowers, instead of soon fading, continue in beauty for weeks without in the least deteriorating.

MISCELLANEOUS PLANTS FOR OUTDOOR CULTURE.

Among hardy plants, the ordinary German Iris, or Flag, as well as the wild English yellow one, is about the best for town gardens. It likes a good rich loam and plenty of water when in growth, and it will do well in either sun or shade. The plants flower freely and well, and as the blooms open

very quickly, look beautifully fresh and clean. Canterbury Bells, the tall Campanulas, Sweet Williams, and other biennials should be sown in nursery beds or large boxes about July for the next year's flowering, be thinned or pricked off, and, if possible, kept in a cold frame during the winter, or protected in some way. Or if this cannot be done, purchase young plants freshly every year; and even in the case of perennials, do not attempt to keep the old plants after they have flowered once, but keep a fresh stock coming on. Any good rich soil, loam if possible, suits them.

Delphiniums are very pretty and flower well, though the lower leaves have a way of dying off which is not at all sightly. The old roots may be left out of doors all winter, as they die quite down; the soil for them should be very deep and rich, and of rather a holding or close nature. Seeds of these sown in July, pricked off into cold frames, and planted out as soon as they begin to grow in spring; or even if sown in early spring in a gentle heat, or even cold frame, grown along quickly and planted out as soon as large enough in deep rich soil, and well watered in dry weather, will bloom in the autumn. The best kinds to grow are *D. formosum*, *D. grandiflorum* and *D. g. coelestinum*, a very pretty variety, and *D. nudicaule*, scarlet. Do not be discouraged if these look small, and as if they would never come into flower, especially in the early stages. They are a long time making up their minds to make a good start, but when once planted out they grow with wonderful rapidity during the summer.

London Pride and Creeping Jenny planted almost anywhere, especially on rockwork, do very well, and the latter does best in a shady place; it is very pretty for hanging baskets or pots, or window boxes. Primroses and Cowslips are fine, especially the former; plant them in good rich loam in a rather shady place to do best. A plant or two of the former put in good loam in a cold frame will produce plenty of nice clean flowers early in spring, as good as you could get in a country copse or wood, if you give it plenty of air when fine and clear. The Everlasting Pea is very pretty, and as it has an underground bulb or tuber, and the top dies down in winter, it does very well, as, indeed, do many plants that do the same; it is such an advantage to them to be hidden from the poisonous fogs and foul air of the dark days; so that the Tiger Lily, the Turk's-cap, the common garden white, and almost any hardy Lily succeed if planted in deep, rich, and somewhat loamy soil. Be sure to put a

handful of sand round each bulb when planting to prevent rotting.

The Wild Blue Hyacinth, left undisturbed, throws up its bright foliage and flowers every spring, though the colour of the latter is not as brilliant as we see it in country lanes and woods. Crocuses do well, too, in rich soil, and we have had very decent Hyacinths out-of-doors, but Tulips are more shy. Plant them about 6 in. deep, with plenty of rotten manure down beneath, but not touching them; do not let the surface of the ground where they are get hard or caked. Marigolds, both the common garden and the French, are very useful. They generally sow themselves, at least the common ones do, and the deep golden and orange, almost scarlet, hue of some of these is very showy. The French are more delicate, and should be sown under glass or some slight protection in spring. The new gold-striped French varieties are really handsome, but we do not recommend the African. Do not omit a few patches, at least, of the lovely Cyanus, or Corn-flowers. Sow the seed in patches or circular rings, with the ground beneath them deeply dug and manured; thin out if too thick, and set three or four slight stakes round the patch with raffia or string tied from one to the other, to keep them up. You will have from a 3d. packet of mixed seed hundreds, if not thousands, of the prettiest flowers imaginable, pure white, white shaded, pink, rose, purple, dark and light blue—more colours than you would care to count.

Among annuals nothing beats Mignonette, and it grows to all appearance as well in London as in the heart of Kent. It likes a light open soil, and will do better in such, if pretty rich, than in stiff loam or clay anywhere in the country. Give it a warm sunny border. Silene pendula compacta and other varieties are very pretty and easy to grow; and Venus' Looking-glass and Candytuft are both fine in good rich soil. The lovely Convolvulus major, or Morning Glory, is a great success; it luxuriates in a very light rich soil, such as old decayed vegetable matter. Sow the seed where it is to flower; and do not sow in heat and transplant, it is quite a mistake; but do not sow before April. The finest we ever saw grew on a little heap of old tan at the foot of a south wall in a Bermondsey tanyard.

Among bedding things, Geraniums, Calceolarias, Verbenas, Petunias, Lobelia, the white Cineraria, or Dusty Miller, are the most successful. A great drawback to scarlet *Geraniums* is that they are apt to go white at the edges of

the flowers, which detracts considerably from their appearance, but good cultivation will do much to amend this; another fault is that when in soil suitable for other things, and especially in wet seasons, they are given to make such tremendous growth at the expense of the flowers. The best plan to counteract this is to grow them in 5-in. pots, and just sink them, pots and all, in the ground in their places. This will check the over-luxuriant growth, and induce a free flowering habit, but you must keep them well watered at the root in so confined a space. The Amaranthus, too, is a capital bedding plant of a nice dwarf habit, and the colour of the foliage is splendid, but it is of not the least use attempting to grow Coleus, Alternantheras, Iresines, and other delicate things of this class; these seldom, especially the Coleus, do much good even in pure country air.

With nearly every kind of plant, seedlings are of no use where a number exactly similar in height, habit, and colour are required. No matter how carefully the seed is saved, there is always some slight variation among the plants in some respect. For all such purposes, cutting plants must be had; but for mixed beds and general display, or where a shade or two in the colour is not of much importance, then seedlings are as good, and indeed we consider them preferable for many reasons. If seedlings must be used, and some degree of exactness is required, grow about half as many plants beyond what you really require, and then, if any do not come quite true, you can replace them from the reserve bed.

Beyond the varieties of plants already enumerated, the following are said to succeed, though many will require care in bad localities:—

<i>Acantholimon glumaceum</i>	<i>Dodecatheon Media</i>
<i>Achillea leupatorium</i>	<i>Dryas octopetala</i>
<i>Anthyllis montana</i>	<i>Echinops ruthenicus</i>
<i>Arabis albida</i>	<i>Epilobium angustifolium</i>
<i>Armeria vulgaris</i>	<i>Erigeron speciosum</i>
", <i>cephalotes</i>	<i>Erinus alpinus</i>
<i>Asclepias</i>	<i>Erodium Manescavii</i>
<i>Aubretia</i> , in var.	<i>Erysimum ochroleucum</i>
<i>Calandrinia umbellata</i>	<i>Eryngium alpinum</i>
<i>Callirhoe</i>	<i>amethystinum</i>
<i>Calistegia dahurca</i>	<i>Funkia grandiflora</i>
<i>Cerastium Biebersteinii</i>	", <i>Sieboldii</i>
", <i>grandiflorum</i>	<i>Galega</i>
<i>Coronilla montana</i>	<i>Gentiana Andrewsii</i>
<i>Corydalis nobilis</i>	", <i>acaulis</i>

<i>Gaultheria procumbens</i>	<i>Ranunculus</i>
<i>Geranium</i>	<i>amplexicaulus</i>
<i>Lambertianum</i>	," <i>spicatus</i>
<i>sanguineum</i>	," <i>montana</i>
<i>striatum</i>	<i>Rudbeckia hirta</i>
<i>Gypsophila prostrata</i>	," <i>speciosa</i>
," <i>paniculata</i>	<i>Saponaria ocymoides</i>
<i>Hedysarum</i>	<i>Sempervivum</i>
<i>Helianthemum, in var.</i>	<i>calcareum</i>
<i>Hepatica angulosa</i>	<i>glaucum</i>
<i>triloba</i>	<i>globeriferum</i>
<i>Iberis corifolia</i>	<i>hirtum</i>
," <i>corœfolia</i>	<i>montanum</i>
," <i>sempervirens</i>	<i>soboliferum</i>
<i>Lithospermum prostratum</i>	<i>Silene alpestris</i>
<i>Monardia didyma</i>	<i>Schafta</i>
<i>Orobus vernus</i>	<i>Statice latifolia</i>
<i>Onosma taurica</i>	<i>Sympyandra pendula</i>
<i>Phlomis herba-venti</i>	<i>Symphitum</i>
<i>Physostegia imbricata</i>	<i>bohemicum</i>
," <i>virginiana</i>	<i>caucasicum</i>
<i>Polygonum cuspidatum</i>	<i>Trollius napellifolius</i>
," <i>vaccinifolium</i>	<i>Tunica saxifraga</i>

FRUIT AND VEGETABLES.

We will now give a few hints on the culture of the Vine, the Strawberry, and the Vegetable Marrow, which trio will be found to be the most suitable in the way of fruit and vegetables to grow in town, and then proceed to window gardening.

The Vine.—*Out-of-doors.*—The great thing is to have a good situation. A Vine will grow and look green on almost any wall, but if you want fruit, and wish it to ripen, you must have a wall facing nearly due south. Moreover, your wall must not be shaded, at least for any considerable portion of the day by any high building, but be freely exposed to the sun's rays from morning to night. Supposing such a favourable position to be secured, however, the next thing to be considered if you want really to make a success of it is the

Border.—Now, though the Vine will grow and often fruit well in almost any kind of soil, yet if this happens to be too much or too little drained, too rich or too poor, your Vine may live, but will not do well; certainly will not give you any presentable fruit. So that unless the soil at the foot of the wall is suitable, or if there is any doubt at all *about it*, by all means make a proper border. The first

point is to give the Vine as much root room as possible within reasonable limits. A border for such a Vine or Vines should certainly not be less than 4 ft. wide, and if it is 8 ft. or 10 ft. so much the better, but it need not be more than that. A suitable depth is $2\frac{1}{2}$ ft. or 3 ft., and you should allow for drainage as well, and if you can raise the bed a foot or so above the ground level, so that all may be high and dry, and consequently warm, for low, wet soils or beds are always colder than high and dry ones—remember this in everything—so much the better. So that if you take out your bed as large as you can up to the size given and make it about as long as it is wide, unless more than one Vine is to be planted, then longer in proportion, to the depth of about 2 ft. 6 in., and if necessary arrange a drain at that depth; it is better to do so in any case. The bottom of the bed should be made hard by ramming stones into it, or, better, making a concrete bottom sloping from both sides slightly down to the centre where the drain is. Put 9 in. or 1 ft. of broken bricks or other clean rubble on the bottom, and over this a layer of grass-sods or turves turned grass side down.

Soil.—Fill up with the most suitable soil you can get. This must not be too rich, or the Vine will make a rapid but soft and fruitless growth, nor must it be too poor and rubbishy. The best soil for the Vine is one naturally rich enough to supply all that is needed, and no more; so that a good sandy loam, rather inclined to be peaty, or else with a small proportion of peat mixed with it, mixed with only a small proportion of leaf-soil or manure, and a slight admixture of crushed bones, burnt oyster-shells, and soot if the soil comes from the country, is most suitable. It should be used in rather a rough state, and trodden in firmly, and also be made 6 in. or 9 in. higher than the ultimate intended level, as it is sure to sink.

Planting and Varieties.—The best time to plant is in spring, just when the young shoots are 3 in. or 4 in. long. The best kinds are, Early Black July, a fine Grape, Early Saumur Frontignan, white, and Royal Muscadine, amber-coloured. The Vine should be planted on a little hillock raised 4 in. or 6 in. above the general level of the bed, for this and all fruit trees cannot endure to have the collar at all buried.

Training.—As to the training, much depends on the height or length of your wall, whether there are any windows in it, &c. Of course if it is a very high wall and the Vine is

to reach the top, you must not spread it out laterally nearly so much as if the wall were only 5 ft. or 6 ft. high, and in such a case the Vines must be put pretty close together, say 5 ft. or 6 ft. apart if the wall is over 12 ft. high, and the main shoots or rods had better be trained up vertically; four or five of these will be sufficient. If the wall be low, then let the main shoot run up to the top without stopping; take out the point and prevent its going any higher, select three or four of the strongest side shoots from this on each side, and pretty nearly equidistant from each other. Train these out laterally or horizontally, and if the wall is not more than 6 ft. high, the side rods may reach to 10 ft. or 12 ft. on each side, but not all at once. When you have got your Vine into shape, that is, as many leaders or rods as you want fairly started in their proper places, let them grow the first year as they like to a length of 6 ft. or 8 ft., then take out the points; this will be about July. They will not grow much more after this, but the strength will flow into the buds forming at the axils of the leaves along these shoots. When pruning time comes—that is, always when the leaves have all fallen in autumn—cut all these long rods back to about 2 ft. from the base, or 3 ft. if very strong. In the spring every bud at the axil of each leaf will develop into a shoot, and these secondary side shoots are those that produce the fruit, though they will not have any to speak of the first two or three years—that is, if the plant was a young one. When these side or fruit-bearing shoots have developed three full-sized leaves stop them, and continue to stop all future shoots from these or any other part of the plant all through the summer, except the one at the end of the main rod if it is a strong one; if not, pinch it out and take the nearest vigorous one you can get. Train this so as to form a continuation of the rod; stop it at 6 ft. or 8 ft. and cut it back to 2 ft. or 3 ft. again in the autumn, so as to let the Vine extend only about 2 ft. each year. In this autumn pruning all the side shoots or spurs must be cut back, leaving only two, or at most, if the second bud is not strong, three buds from the base. In spring each of these will produce a shoot, and just as they start you must go over them, and pinch out all but the strongest and fattest looking, leaving only one. These will, the third or fourth year, show fruit at the third or fourth joint, and as soon as you can see the blossom, pinch out the point of the shoot at one joint beyond the fruit, and all barren shoots to be served the same at the third or fourth joint. Now you have

the whole system at a glance; the main rods trained straight and equidistant either horizontally or vertically, as may be most convenient, and the side shoots, bearing the fruit, regularly thinned out in spring, leaving only the one most likely to bear fruit, these stopped and in autumn pruned back. As soon as a main shoot or rod gets worn out, from the excess of eyes formed, which will be after three or four years of fruit bearing, cut it right out, and induce another young one to take its place, springing from the base. There are other systems of training Vines, but this is, in our experience, the best, at least for out-door work. What is termed the "long rod" system is very good, but more suitable for Vines under glass.

Watering.—Plenty of water must be given at the roots, especially in such a made and drained border, just when the fruit is swelling, but only if the weather is dry and artificial moisture is needed, as the Vine does best in a somewhat dry soil; and you cannot syringe the foliage too often in dry weather, except just when the Vine is in bloom and setting the fruit, when it is better to be kept dry, and, of course, when the fruit is ripening no moisture is needed.

The Strawberry.—Strawberries may be grown in an ordinary bed in the garden, as in the country, but we should strongly recommend a higher and more favourable situation, such as a raised bed, or one made on a flat roof of an out-house or on the house itself. Strawberries do not require a great depth of soil to grow and fruit in, so that a bed made in a good-sized box or case, 1 ft. or more deep, and as large as possible, or a raised bed with boards for the sides, will suit them capitally. Some inches, as many as you have room for, of gravel or "ballast" should be placed in the bottom, over that a layer of Grass sods or spent Hops, and then fill up with good loam, rather inclined to be sandy, with a small admixture of very old and decayed manure or leaf-mould, put your plants in 1 ft. or at most 15 in. apart, or even less, for you will do best with small crowns close together, especially where room is limited, and make the soil very firm, indeed hard. We advise planting in spring, for these and for everything else in fact, so that the plants may get a good hold on the ground before winter. Protect them with litter or in some way in winter; in fact, if you can do it, it is far better to have glass over them at this season; the plants will bear next spring. Any kind will do that is vigorous and free bearing, and a late kind rather than an

early one, so that it is hardy as well. Syringe the plants pretty often when starting, and again when the fruit is swelling, and at this time supply what sustenance is necessary by means of frequent soakings of liquid manure at the root, taking care that the liquid does not touch the leaves or fruit. Of course the plants must be exposed to the full power of the sun at all times, or there will be little or no fruit.

Propagating, &c.—Take layers off into 3-in. or 4-in. pots at the proper season, setting the pots on the bed, and a stone on the runner to keep it in place till rooted; and stop the runner beyond the pot. As soon as well rooted and established, separate them from the old plants, and stand or plunge them close together in a sunny place, either for the formation of new beds, or for shifting into larger pots to be fruited there. Strawberries in beds must have all runners that are not required for propagation removed as soon as they appear; they must be kept well weeded and the surface occasionally stirred, though the soil must be made and kept firm. Do not let a bed stay after it has fruited for two years, but make a new one. Just as they are starting the second year give a top-dressing of rich soil, and do not stint them of liquid manure when the fruit is set, especially if the weather is dry.

In Pots under Glass.—If you have a greenhouse or a frame or two, plants grown in pots under glass give the best results. The layers for these are rather better taken from beds; you can very likely purchase them, but you can get them from pot plants as well if there is no other way. Layer them into large 3-in. or 4-in. pots as early as you can, using a nice rich sandy loam and not much drainage. As soon as rooted, separate them and stand close together on, or plunge in, ashes in a sunny place. See that they have enough water, and when the pots are full of roots shift into 6-in. pots, and plunge or stand as before out-of-doors. Give them plenty of water, and when getting pot-bound give liquid manure pretty strong at every other watering, and vary the nature of this as much as you can, using manure water, soot water, guano, &c., in turn. As soon as the air gets dirty, about October, remove to a cold frame or house and plunge in ashes or hops, &c., close to the glass, and do not crowd them too much. Give plenty of air, and in spring a few may be removed to a sunny shelf of a greenhouse, and liquid manure and water given as required when they start into growth, or a frame

with a bed of gently fermenting material be prepared and filled with some of the forwardest of them, plunged in March or April; these will fruit early, but do not let the roots get through the pots into the manure, &c., beneath, or you will have nothing but leaves, and fine ones, too; or they may be left to fruit in the cold frame. The main thing is to get the plants well ripened and hardened in the open air in autumn for the next year's fruiting. Do not over-water them at that season, but give enough to keep the soil just moist and prevent the plants flagging. Always prefer plants having one rather smallish, but firm and prominent, central bud or crown.

Vegetable Marrows.—The way to grow these is to have a raised bed, with plenty of nice, sweet, fermenting materials underneath, in a warm and open situation, and yet protected from cutting, and especially from east, winds, which are most injurious in town gardens. Nothing is better than stable manure, if this can be had, though it must be well sweetened before use. Put a barrowful of good loam, with some leaf-mould or decayed manure, on the top, and if you are in good time, not later than the middle of May, sow the seeds on this under a hand-glass, or a bottomless box, and a sheet of glass over it will do well. When up, and the second rough leaf is formed, throw away the weaker ones, and plant the two strongest and stockiest as far apart on the bed as you can; if the bed is small, one plant will do. Cover them over with the glazed boxes till they have got a good start and begun to run; then remove. Give water (tepid) when needed, and by the end of June and in July they will make a wonderful growth. Do not stop them, but let them run, though if so many fruit begin to swell on a single shoot that it cannot supply them, and they begin to turn yellow or drop, take out the point, so as to throw the strength into the fruit.

Give plenty of water, and syringe the foliage frequently. Good fruit can also be grown by planting in good-sized boxes or artificial beds on a flat roof, and they will often do better on such a raised position than down on the ground. Put plenty of drainage in the box, and fill up with a mixture of equal parts of good loam and manure in a half-decayed state, or fresh, so that it is sweet, is best.

Plant the Marrows out in June. Where no special hot-bed is made early enough to raise the seeds, this can be done in pots or boxes of sandy loam and leaf-mould, placing them in a frame with gentle heat, or in a greenhouse, or a warm

kitchen window. When the first rough leaf is formed, pot off singly into large 3-in. or 4-in. pots; harden off, and plant out in the boxes or beds early in June, or earlier if there is any bottom-heat. But there is no absolute necessity for this latter. We have seen some of the finest plants and fruit produced by putting a couple of plants into a frame that had been used for raising bedding plants; when these had been removed and the heat had subsided, the lights were kept on for a time, and when the plants began to run outside taken away altogether. We have found Moore's Vegetable Cream and the Long White the best kinds to grow.

P A R T II.

WINDOW GARDENING.

EVERY one has not a garden, and but few can indulge in the luxury of a greenhouse, but everyone has at least a window or two that can be utilized for growing flowers, either inside or outside, or both ; and what can be prettier than a window full of well-grown plants ? On the window-sill outside, in pots or a box, or in the room itself, many things may be successfully cultivated in any town, however large and smoky ; and we will now show what plants are most suitable for such places, and the best mode of bringing them to the highest state of perfection. But we must again here call attention to the remarks given at the beginning of this little work about attention to cleanliness, &c. ; these are even of more importance here than as applying to outdoor gardening, for plants in pots and small boxes are more difficult to keep in health, and far more easily injured by even slight neglect than those in beds out of doors. So that constant, unvarying attention and care are indispensable to the satisfactory culture of plants in windows ; more so, indeed, than in any other situation.

There is no excuse for any neglect of the plants, for a window, or even three or four windows, hold comparatively so few, that it is easy to attend to them as they should be attended to ; while, where greenhouses are employed, and many hundreds, or perhaps thousands, of pot-plants grown, it is excusable for some to get overlooked or neglected sometimes. Remember that a day's or even an hour's neglect in critical periods will often undo and spoil the results of months of previous watching and care.

In window gardening there are some things that must always be kept inside; some that, protected from the cold of winter by being placed inside, may be exposed to the open air with advantage in summer; and some again that will stand the exposure outside both in winter and summer, but there are very few of these last. If plants are grown inside the window, it is absolutely necessary that there be no gas burned, not only in the room itself, but in any part of the house, except, perhaps, a very distant portion. Even in the sweet country air, gas sadly injures anything that comes in contact with its fumes; but here, where everything is against them, it is certain death to almost every kind of plant if exposed to its influence for any length of time. Even where no gas is used it will be found difficult to get more than a very few plants to flourish and look healthy in an ordinary living or sitting-room. The air, always dry and harsh in towns, is still more so in a room where a fire is often burning; the air is often close, for if the window is much open the "blacks" come in so badly. Always dusty, the air is still fuller of particles where people are moving about. All these things are against the plants, but do not despair. Study their wants and requirements, do the best you can for them, and you are sure to succeed with something. The best place is a room not very much used, where the air is still and not so very dry. The window should look south, or in a southerly direction, to suit most flowering plants, but an east or west aspect will do for most things almost as well; and Ferns, even some greenhouse Ferns, will flourish as well in an east, west, or north aspect as in a more sunny position, perhaps better.

All plants should be kept as close as possible to the light—that is, to the glass—and by no means crowd them together. Four or five good-sized plants are quite enough for an ordinary moderate-sized sash window, unless you have a proper stand, and another rank behind the first. Unless used to gardening operations, do not try a lot of delicate things at first, though you may be fond of them; far better have only good hardy plants, such as Geraniums and Fuchsias, until you have got the knack of managing them, when you may, if you like, go in for something more ambitious. Lists of the most suitable plants are given a little farther on. The main thing after the plants are once established is to keep them clean. In summer when it rains gently place your plants out of doors to get their leaves washed and enjoy the beneficial effects of a shower; and in

winter take them into the back kitchen or yard or other suitable place, and syringe them or shower them overhead well with a fine-rosed watering-pot, or even a good sprinkle with a brush will do in default of anything better, using clean water at a temperature of 65° or 70°, or tepid. If you can get it, always use soft water for plants, both at the root or otherwise, in preference to any other.

All plants should be potted in good fresh soil at least once a year, and the material used should be of the very best description. Full directions regarding composts, &c., have been given. A bushel of good potting mould can be purchased at any nurseryman's for 1s.; this will fill a good many pots, and will be a shilling well laid out; be sure and tell the man what kind of plants you want it for. About the best mixture for the ordinary run of window plants is three parts of good fibrous loam, and one part each of leaf-soil and well decayed manure, with a good sprinkling of silver sand and a little crushed charcoal to keep it sweet.

The best plants for cultivating inside windows are—

<i>Acanthus latifolius</i> (Bear's Breech)	* <i>Geraniums</i> (Zonal)
* <i>Amaryllis purpurea</i> (Vallota or Scarborough Lily)	<i>Grevillea robusta</i>
<i>Aralia Sieboldii</i> and var.	<i>Hyacinths</i>
* <i>Aspidistra lurida</i> and <i>A. l. varie-</i> <i>gata</i>	* <i>Lobelias</i>
* <i>Begonias</i>	<i>Mignonette</i>
* <i>Calceolarias</i> (shrubby)	* <i>Mimulus</i> (Monkey Flower)
* <i>Calla</i> (or Arum) Lily	* <i>Musk</i>
* <i>Campanulas</i>	* <i>Pelargoniums</i> (show and fancy)
<i>Cannas</i>	<i>Primula verticillata</i>
<i>Echeverias</i> , in var.	* <i>Petunias</i>
* <i>Ficus elastica</i> (Indiarubber Plant)	* <i>Spiraea japonica</i>
<i>Ficus Parcelli</i>	<i>Zea japonica</i> (Japanese Maize)
<i>Fuchsias</i>	<i>Tritelia</i> (the Star Flower)
	<i>Tropaeolums</i> , bulbous rooted
	<i>Tulips</i>

The above are suitable for very thickly inhabited and smoky parts; but in such districts as Brixton, Kensington, Camden Town, Hoxton, Bow, &c., or anywhere but in the heart of a large town, the above list may be augmented by the following:—

<i>Azaleas</i>	* <i>Deutzias</i>
* <i>Abutilons</i>	* <i>Dracennas</i>
* <i>Balsams</i>	<i>Festuca glauca</i>
<i>Bouvardias</i>	* <i>Ficus Cooperi</i>
<i>Camellias</i>	* <i>Genistas</i>
<i>Coronillas</i>	* <i>Heliotropes</i>
<i>Cyclamen</i>	<i>Isolepis gracilis</i>

Liliums, of sorts	Smilax (<i>Myrsiphyllum asparagoides</i>), a very delicate and graceful climber)
*Myrtles Nierembergias (for hanging baskets)	The Sensitive Plant (<i>Mimosa pudica</i>)
*Primulas (Chinese) Roses (China and the Fairy Rose best)	*Thunbergias

The most easily cultivated are marked (*).

It is little use trying to raise plants from cuttings where only a room and window are available, excepting, perhaps, Geraniums, which will strike anywhere in July and August; or unless you have a bell-glass or two, under which you may root almost anything. Put the cuttings thickly in small pots, using sandy soil, and cover with the bell-glass, only removing it for half an hour morning and evening, and shading from bright sun; pot off when rooted. It is much better on the whole to buy a few healthy young plants and keep them as long as possible; they only cost a few pence each. But we would warn our readers against buying pot plants from the trucks in the streets, as a rule, unless you only want a temporary display. There are exceptions, of course, but in most cases these plants have been raised in a healthy country place; they are young plants grown rapidly in heat and forced early into bloom, so that they have no constitutions, and when removed into the dry and ungenial air of a town room or window speedily droop and die. Their fresh and delicate beauty is often a direct evidence of their want of strength, and the only way to save them is to place them in a greenhouse or conservatory, or even in a window case or frame, in which they may find something approaching the atmospheric conditions in which they were grown, and then to harden and gradually inure them to their new and less genial surroundings. Fuchsias especially are very often grievously disappointing when purchased in this way; at the best there are only comparatively few kinds that can be successfully grown in towns, and when naturally delicate varieties are subjected to the severe check described, the opening buds speedily drop off and the plants lose all their beauty if they do not die outright. But though it is not easy to raise cuttings, seeds of many things may be sown and successfully grown into good plants. A few suitable for this purpose are Lobelias, Petunias, Mignonette, &c. Full directions for sowing seeds have already been given.

For sunny windows have Geraniums, Pelargoniums,

Lobelias, and other sun-loving plants; but if shady, Ferns, Fuchsias, Begonias, and such things would do better, and a hanging pot or two of *Campanula grandiflora*, Creeping Jenny, or Lobelia is always effective.

Potting, Watering, &c.—For the benefit of those who are not acquainted with the *modus operandi* of potting we give a few hints upon the proper method of performing this and other similar operations. We have found that it is better, as a rule, to do all potting in spring, instead of autumn, as is the usual practice. If any shifting, &c., is obliged to be done at the approach of winter, get it done in good time, not later than September, so that the roots may be feeling the sides of the pots before the trying season comes on. Of course an exception must be made in the case of all bulbs for spring-blooming, Hyacinths, Tulips, &c., which should be put in the soil in September or October. The most important point in potting is to have everything as clean as possible, pots and crocks all scrubbed both inside and out, and rinsed in clean water afterwards. You cannot grow healthy plants in dirty pots. These must also be perfectly dry when used, or it will be as bad or worse than if dirty. The soil must be sweet and fresh. It should have been stored under cover, but exposed to the action of the air for some time before use, and should never have been allowed to get either wet or dust dry; least of all should it be in either of these states when used, but in just such a state that a handful taken and squeezed together should only just stick together till touched, and then fall to pieces again. Having your pots and soil all ready, put a largish piece of crock over the drainage hole, then two or three smaller pieces, and then a sprinkling of bits about the size of a small bean. Some plants, especially those that require an extra abundant supply of water, need more drainage than this; also in the case of pots for seeds or cuttings, which should be nearly or quite half full of drainage, but for most things this will be sufficient. Over the crocks place a handful of green Moss or spent Hops, to prevent the fine soil washing down and clogging the drainage, and then some of the rougher parts of the soil. Now if you are merely shifting the plant, that is, transferring it from a small pot to a larger one, and if it has not been very long in the former, merely turn it out, reversing it on your hand; remove the old crocks, also any loose soil, dead roots, or Moss upon the surface, and set it in the new pot, so that the old surface shall be only just covered by the new; fill in

the soil all round, pressing it in pretty firmly; it is a good thing to use a flat-ended piece of lath for this purpose round the old "ball," as it is called. Do not make the soil, however, very hard, especially if a rapid growth rather than early flowering is wanted, or if the plant will have to stay in its present pot for any great length of time. Finish off the surface nearly level, but for Fuchsias, Geraniums, and other plants that require a liberal supply of water, and are not likely to decay at the neck, leave the centre rather lower than the sides, so that the water shall not run away and leave the centre dry. For hard-wooded and delicate things, however, the soil should be level; always leave about half an inch below the rim to allow for watering.

Give the plant, or rather the soil, a good watering from a fine-rosed pot or syringe to make the surface firm, and use the same in preference to the spout in all waterings for some days till the soil has got settled. It is not advisable to keep on shifting plants into larger pots after they have attained a certain reasonable and movable size; a 5-in. or 6-in. pot, or what is known as a 48 or 32 size, is quite large enough for the majority of window plants. So when a plant reaches such a size and requires potting again, prepare one of the same size, turn the old ball out, and break or shake away nearly all the old soil, leaving just a little on the roots; if these are very long, shorten the strongest back considerably, leaving the short fibrous ones untouched. Put it into the new pot, spreading the roots out as evenly and naturally as possible, and working the fresh soil in and amongst them nicely; fill up and press firmly, then give a good watering. It is advisable, wherever possible, to shut up the plants pretty close in a frame or pit after this operation until they have recovered the check; at any rate put them in as quiet and shady a place as you have. If the plant has developed a large head, however, it is better to have pruned it back considerably before repotting. Harden the plants as much as possible by standing out of doors in a sunny place and giving only very little water for a time, then cut back pretty closely; put in a close and warm frame or house, or keep shaded and quiet, giving only very little water till the young shoots have broken, and when these are 1 in. or $1\frac{1}{2}$ in. long repot as above. This should always be done in spring or summer.

Do not give newly potted plants more water than just sufficient to keep the soil moist for some time until the roots have got well to the sides of the pot again, as if the new

soil, before it is occupied by the roots, gets very wet or sodden, it is apt to sour, and then the roots will not like it or run freely in it, and the plant will become sickly.

The period at which plants require most water is when they are growing vigorously or flowering, or both; then they can scarcely have too much, especially if the weather is warm; but one rule must be always observed—never water a plant until it requires it, that is, when the soil is dry, or nearly so, though you need not wait until the plant flags. When the plant wants it, be it twice a day or once a month, give it a good soaking, and leave it alone till wanted again. Again, do not let plants stand in a saucer of water, but let all superfluous moisture run freely away. There are some exceptions to this—viz., Arum or Calla Lilies, Spiræas, Musk, and even Fuchsias when in full flower in hot weather require so frequent waterings, that it is better to let them stand, at least for a time, in a saucer of water and suck it up, as they will speedily do. But such a practice is almost certain death to any delicate-rooted plants if frequently done, or continued for any length of time.

Never water plants with very cold water, but from October to May, at least for indoor plants, use tepid water at a temperature of 60° to 65°. Manure water may be beneficially employed for plants that have become what is termed pot-bound, that is, the pots full of roots, when they need some extra nourishment. This may be made in several ways; put about a bushel of fresh horse or sheep droppings, into a good-sized tub or barrel, fill up with water, add a handful of lime, and stir all up well, then let it settle till next day, and one part of this diluted with about two parts of water makes a capital stimulant. Never use it stronger than weak tea, and it should always be used in a clear state, not thick or muddy. The old rule for this, and a very good one it is, is “weak, clear, and often.” Soot water, not too strong, made by beating up a spadeful of soot in a little water to a thick paste, and then diluted, may be used with advantage to virgin soil, but not to ordinary town soil; that is too sooty already. Or sulphate of ammonia dissolved in water in the proportion of about half an ounce to the gallon is very good for many things, especially Pelargoniums; it induces a plentiful bloom. Guano water, too, in the proportion of an ounce to the gallon, or rather weaker for delicate things, is useful.

If you wish to have good individual specimens, only grow a few plants and turn each round occasionally, so as

to expose all parts to an equal share of light, and balance the growth, but if you aim at filling the window as full as possible, do not attempt this, but arrange your plants pretty closely, so as to contrast and look well, and never turn or move them, but let them "grow in" altogether, and produce a solid bank. We must confess we do not personally admire this style, but tastes differ, and it seems to please some people very well.

Where plants are grown in a room that is not much used, or in any case, indeed, the air must not be allowed to become stuffy or close from keeping the window too much closed; on the contrary, the internal air should be changed as often as possible, and to this end a little air should be given—*i.e.*, the window should be opened a little way for an hour or two at least every day, except in severe weather in winter. Such plants as Ferns, Begonias, &c., require comparatively little air, and should never be exposed to wind or a thorough draught. For all such things opening the window a few inches, more or less, at the top only on fine days for a few hours will in general suffice. Fuchsias require a more free supply of air than this, and Geraniums, Pelargoniums, Balsams, and others must have as much as possible whenever the weather is at all genial, and the thermometer outside above 50° or 55°. In all cases it is far better to open the window-sash at the top than at the bottom.

One other hint. Never paint flower-pots, but keep all the pores as clean and open as possible. It is better to give your plants air at night and in the early morning when the weather is warm, as it is then far purer and more healthful than in the daytime, when so many fires are going. For the same reason we give more air on Saturday evenings, Sundays, and on to Monday mornings; also on general holidays. All these things make a difference, though it may be only a small one, but "many a mickle makes a muckle," so do not neglect one.

WINDOW GARDENING OUTSIDE.

This is, as a rule, suitable for the summer season only, as few plants, especially if in pots, will live exposed to the *open air* in winter in a town. About the only plants we know of that will stand such an ordeal is a good strong Carnation, or Houseleek, or a pot of Thrift, which is a splendid

town plant, and does well in a pot too; Adam's Needles, Yuccas, and Ivy of various kinds. The former we have seen exposed in a small pot on an open windowsill through all seasons, and yet growing, and every autumn producing numbers of beautiful flowers.

Boxes v. Pots.—It is a very usual plan to keep pot plants indoors during the winter, and to put them outside on the sill in summer. This is a very good plan in theory, but not in practice. One great objection is, that plants in pots on a dry position like a window sill, exposed to the air all round, so quickly get very dry in summer, that unless you are constantly watering they are in a chronic state of flagginess, and often become withered and stunted. This constant watering, besides being a great labour, is very injurious to the plants. But beyond this where the window faces anything like south, the pots are exposed to the full blaze of the summer sun, and soon get so hot that the tender rootlets coiled round the inside get scorched and destroyed, and so the plant suffers and sometimes dies. And again the pots are very apt to get blown down and broken by wind; so that it is far better in any case, and for south or southerly windows almost absolutely necessary, to have the pots protected in some way, and the best means of doing this is to have a suitable box, and sink the pots in this, surrounding them with moss, tan, hops, cocoa-nut fibre refuse, or any open material, both to keep them steady, and retain moisture; or the box may be filled with suitable soil, and the plants set out in this, just as if it were a garden bed; but on the whole we prefer the former plan for many reasons.

Form of Box.—The box should be as large as possible—i.e., it should be as long as the sill itself, and as wide as this also, or wider, for it will be a great advantage, especially if the sill is narrow, to allow it to project a few inches beyond; it can easily be supported by iron or wooden brackets, or held up in some way, so that if you can extend it to 8 in. or 9 in. in width, or even more, it will be far more serviceable than if it were only 5 in. or 6 in. The depth need not be great, certainly not so much so as to look unwieldy or awkward, from 5 in. to 7 in., or 8 in. inside being plenty. A very good size is the length of the sill, say 2 ft. 6 in. or 3 ft. by 6½ in. wide and 5½ in. deep, inside measurement, though make it wider if you can, but this size can be made without any cutting except sawing the lengths off from a piece of flooring board, which can be had for a very low price at any timber yard. The usual price is 1d. per foot, so that supposing your window-

sill is 3 ft. long, you want three lengths, one for each side and one for the bottom, with 1 ft. extra to make the two ends, and the whole will only cost 10d. Nail the two sides on to the edge of the bottom, and the ends inside; eight or ten holes should be made with a $\frac{1}{4}$ -in. augur in the bottom, and three or four cross strips, about $\frac{1}{4}$ -in. thick, be nailed on the bottom, so as to allow the water to run freely away. The box would be the better for a coat of paint outside, but leave the inside plain if you intend to fill it with soil, but if the plunging plan is to be adopted, paint inside and out green, or a good chocolate we consider the best colour; or it may be thinly coated with a mixture of clay, cow manure, and water. If you want to ornament it, get some straight stakes, such as stout beansticks, cut into lengths with the bark on, split them in halves, and either point the tops and nail them on outside, round side out, all along the front, or cut them to fit, and fasten them on in diamonds, squares, or any convenient shape; or pieces of virgin cork may be tastefully disposed on the front. In any case, varnish over the whole when completed. The glazed tiles so much used make an admirable front for such flower boxes, if the colours on these are not too violent and glaring, which is too often the case.

Most plants grow more freely, and become more dwarf and compact in habit when planted out in soil in the boxes, but when the pots are plunged you can change one that has gone out of bloom or become unhealthy for a fresh one, or turn the plants round, or re-arrange them afresh. So you must consider your resources, and do which you like best; but if well done and all the plants healthy, the planting out gives the better general effect, especially if you have a neat border of Lobelia or Golden Feather, and then you can put the plants in so much closer, and have more than if they were in pots.

Soil for Window Boxes.—In preparing a box for filling with soil, put a good large flat crock or piece of broken tile over each hole, and then cover the bottom with about $1\frac{1}{2}$ inch of crocks, bricks broken small, or ballast; on this a layer of old spent hops, or littery half-decayed manure, and fill up with soil. The best for this purpose is that recommended for potting—viz., two parts of good fibrous loam or decayed turf and one part each of leaf-mould and well-rotted manure, with a little crushed charcoal and sand. But any good garden soil will do, if not too fine or rubbishy, mixed with a good proportion of old decayed manure; the *leaf soil* is not absolutely necessary, but have fresh country

soil if you can get it. Make the soil pretty firm, especially at the bottom, and set the plants out, the smallest in front (outside) and the taller ones behind. Give a good watering to settle the soil, and the box is complete. Where the pots are to be plunged, no drainage, except a crock over each hole, is needed, but just set the pots in their places and pack the cocoa-nut fibre, or what you have, firmly between and among them. Of course in this case the pots must be watered separately as required, but it is well to keep the plunging material moist also.

Arranging the Plants.—A few arrangements of common easily-grown plants are given as under:—1, A scarlet or white Geranium and a stiff-growing Fuchsia alternately for the back row, having a Geranium at each end, and a border of Lobelia or Golden Feather, or these arranged alternately along the front; 2, a tall old white Fuchsia, such as Mrs. Bennett, in the centre, with a good scarlet Geranium on each side of it, and smaller Geraniums, Fuchsias, or yellow Calceolarias again on either side of these, with an edge as for the last, or you may break the monotony by having a drooping Fuchsia, such as Mrs. Marshall, to hang over the front in the centre, or one at each end; 3, a Balsam (white) and a scarlet Geranium, or white and scarlet Geraniums alternately along the back, and a row of Petunias or a white Petunia and a Lobelia alternately along the front. About the best white Geranium, especially where a dwarf habit of growth is desirable, is White Vesuvius; it is equally suitable for pots, boxes, or for bedding; 4, same as the last, but have a white Stock alternately with the scarlet Geraniums, or a white and purple Stock alternately with the same bordering or any of those mentioned (Creeping Jenny makes a splendid edging for a box, especially in a shady window, it hangs over the front so beautifully); 5, Stocks in alternate or any variety of colours for the back, and a row of Mignonette sown previously along the front (this will grow and droop over, and you will have a bouquet with these two); 6, a row of Tom Thumb Nasturtium or *Tropaeolum*, scarlet, sown in its place in April, and thinned out as required for the back, and a row of white Petunias or Verbenas along the front. Yellow Calceolarias (shabby) contrast well with scarlet Geraniums; they do well in pots if carefully grown, particularly on a shady aspect. These may be transposed or added to *ad libitum*. It is a great improvement to sow a few seeds of major *Convolvulus* at each end of the box,

and let them run up strings properly arranged, or a couple of long withies or canes bent over and stuck in at each end so as to form an arch. This looks very pretty, and another plan is to get a couple of young roots of Virginian Creeper, just little rooted pieces with two or three shoots just starting, and put them in at the ends and train them over. We have, unfortunately, never tried Thunbergias for this particular purpose, at least not in town, though they do splendidly in the country, but we recommend giving them a trial; they are wondrously pretty, especially the dark-eyed ones, and will stand anything almost, but they have to be raised in heat and planted out early in June. Ivies, too, of many kinds, make an admirable framework for a window; they may either be trained up strings or wires, or nailed to the brickwork on each side. They may be planted in the box, or will grow in pots very well. The common small-leaved wild Ivy is very pretty, at least in our opinion, though it is rather slow in making a start. Veitch's Virginian Creeper is a beautiful little thing for such a purpose. It will do well, and grow quite large enough, in a pot. The Canary Creeper (*Tropaeolum peregrinum*) may be sown, like the *Convolvulus*, a few at each end of the box, or in pots, and will run up a few strings and afford a profusion of its pretty yellow flowers. Clematises, too, of various kinds, particularly free flowering sorts, like Jack-mannis, will grow several feet high, and flower well in a 5-in. pot.

Plants on Balconies.—In some places there is a light iron or stone balcony outside the windows of the better class of houses; these afford the opportunity for a grand display, and the same remarks apply as to window-sills. It is much preferable even where plants in pots are used to have boxes arranged on the balcony, and plunge the pots in them in some open material, as directed above; it keeps the roots cool, protects them, holds moisture, and does away with the need for so frequent waterings. Many plants suitable for balconies must be grown in pots, such as *Pelargoniums*, *Calla* or *Arum Lilies*, *Spiræas*, &c., though the majority of plants can be grown turned out into the soil, as above, with good results. Much larger boxes may be used here with good effect; in fact, have them as large, as wide, and deep as possible, so that they can be conveniently attended to. On large balconies, flat roofs, &c., something like permanent borders can be constructed in this way or with a few stout boards, and quite a flower garden on a small scale may thus

be had when there is perhaps no other space for any thing of the kind. Often in such an elevated and airy position plants will do much better than in deep well-like courts, where the plants inevitably get drawn and leggy from the light and air being so far above them.

Treatment of Outside Window Plants.—The last week in May is about the most suitable time to fill the boxes with plants. When these get pretty well grown, so as to occupy the soil with roots, and as the weather becomes warm, a plentiful supply of water will be needed, especially if the box stands in a sunny window. Do not, as a rule, give water in the daytime, when the sun is shining, though if the plants are flagging, some may be given at any time at the root only, but do not let a spot get on the leaves in sunshine, or it will turn brown wherever it touches. The best time to water all plants in hot weather is in the evening, when the sun has set; give a good soaking to the soil and roots, and a gentle, but plentiful shower overhead to cleanse the foliage and refresh the plants. In this way the roots are feeding and the plants getting strength from the moist soil all night long, as evaporation is greatly reduced, or ceases altogether during the night, and so the plants are able to bear the ordeal of the hot day that follows. If water is given in the morning it is all evaporated in two or three hours, and the plants receive but little benefit. Water again in the morning if needed, and if the day promises to be hot give a good shower overhead early, so that the foliage may be dry before the sun gets strong. Avoid wetting the flowers as much as you can, as it spoils them so. Do not be afraid of giving too much water in hot or dry weather especially, but leave the plants all glistening and dripping; use a syringe, if you have one, in preference to a water-pot, as it is more effectual and gentle. Manure water should be given two or three times a week as the season advances, as the plants, having filled the box and soil with roots, need some extra nourishment. Use this as directed for pot plants, or it may be rather stronger for boxes. Tie the plants to neat stakes if they require it, and do whatever training is needed regularly and carefully. Raffia Grass is better and neater for tying than anything else. If you have any climbers put the necessary sticks, strings, or wires to them in good time, and keep them carefully tied up as they advance; never allow them to stay too long without attention and get into a tangled mass.

Plants suitable for Outside Window Gardening.—

append a list of plants suitable for outside windows, balconies, &c., in pots or boxes :—

Amarantus mel. ruber and varieties	Maurandya Barclayana (climber), purple and white
Balsams	Mesembryanthemums, of sorts
Calceolarias	Mignonette
*Calla or Arum Lilies	Mimulus
Carnations	Nemophila
Chrysanthemums, particularly dwarf pompons, in pots	*Pelargoniums (show and fancy)
Clematis, of sorts	Petunias
Convolvulus major	*Spiraea japonica and varieties
Creeping Jenny (Moneywort)	Stocks (Intermediate or German)
Crocuses	Sedums (Stonecrop) in pots, the best are S. spectabile and S. Sieboldii variegatum
Fuchsias, of sorts	Saxifraga Burseriana and longifolia, &c.
Eranthus hyemalis (Winter Aconite)	Sempervivum Boisseri and tectorum
Narcissus	Thrift (Armeria) does well in pots on sill
Geraniums (flowering zonals and gold and silver bicolors only)	Thunbergias (cl.)
Golden Feather (Pyrethrum)	Tulips
House-leek (common, in pots)	Verbenas {venosa and montana are good}
Hyacinths	Yuccas (Adam's Needle), fine in winter
Ivies (especially the Irish and other varieties are fine in winter)	
Lobelias	
Lophospermum scandens (climber)	

All these will do well in towns, and can only be slightly added to by such things as Heliotropes, dwarf Roses, &c., for country places. Those marked (*) should only be grown in pots. All the others may either be grown in pots and plunged, or planted out in the soil in boxes; the annuals, at least the Mignonette and Convolvulus, are better sown in their places, and not transplanted. Hyacinths, Tulips, &c., may be planted in outside boxes in October or November; put them in 3 or 4 in. deep in rich soil, and surround each bulb with dry silver sand to prevent decay; give little or no water during the winter for fear of freezing. When the crowns appear above ground, if the weather is cold and biting, cover them up for a while with a little heap of coco-fibre refuse or leaf-mould, and if it continues ungenial, use an inverted flower-pot to protect them until fine enough for them to escape being nipped, and for the flowers to expand.

Window Cases.—There is one other branch of window gardening which, though it cannot be indulged in quite by every one, is yet within the reach of most people if they make up their minds to it, and which is, moreover, much the

prettiest and most successful arrangement we know of. We refer to the use of window cases. These may be fixed either inside or outside of the sash, but for several reasons (light, saving of room, &c.) are better outside. Being, in fact, a miniature greenhouse, a very large proportion of the soot, smoke, and dirt, that would otherwise be deposited on the leaves, &c., of the plants, is entirely prevented, thereby keeping them not only far cleaner and brighter in appearance, but much more healthy and vigorous as well. Moreover, an artificially moist and warm atmosphere can be maintained within a glass case (which is a wonderful advantage), rapid evaporation is prevented, and there are other points favourable to success which need not be enumerated.

It is true that good window cases are expensive to purchase ready-made, but with many people moderate expense is not an object, and some extremely elegant designs can now be obtained. But it is by no means difficult to make a case quite good enough for ordinary purposes, and even if it must be plain, yet, if well done, it may be neat enough to please even a fastidious eye. Any handy man with a little knowledge of carpentry and a few tools, some strips of red deal, and a few sheets of glass (which only costs 2d. a foot cut to size), can produce a neat and useful affair for a few shillings. The bottom of the case should consist of a strong wooden box or tray, as long and as wide as the space to be filled, and from 6 in. to 8 in. or 9 in. deep. This should be made of the best red deal, 1 in. or 1½ in. thick; upright strips of well-seasoned wood, also 1¼ in. or 1½ in. square, and rabbetted or grooved on two sides to take the glass, should be fixed at the corners; crossbars, also rabbetted or grooved, must be fitted to connect the upper ends of these, and the top should be made sloping at an angle of 30° to 45°. We think that a flat, sloping top looks quite as well as a rounded one, and it is much less expensive. The wooden tray at the bottom should have an inner one of metal, preferably zinc, constructed to fit it exactly, to hold the earth and plants, for, as paint is not admissible inside, the wood would soon decay, and both the metal and wooden tray should have plenty of holes corresponding in the bottom to allow surplus water to escape. It is better to have a short piece of metal pipe soldered into each hole, and running through the wood below, but not projecting much below, so as to keep the wooden bottom quite dry.

The case should be constructed just high enough to meet the junction of the upper and lower sashes of the window

frame. Unless it is made with a separate front (towards the room) and a door, the upper rail of the case should not be in any way fixed to the lower rail of the upper window sash (which is, of course, outside), but only just fit against it as closely as possible, so that the upper sash may at any time be pulled down to admit air into the room. In this way the case will only have the front (outside) and the two sides glazed, and the inner side will be formed by the lower window sash, which, on being pushed up, will afford entrance to the case; or the case may be made entirely separate from the window, with a door on the inside. The former plan is, however, more economical and convenient. In any case, some aperture must be provided at the top that may be opened to admit air. In the plan first described, almost enough will be afforded by pulling the upper window sash down a few inches, as the glass falls back from the level of the rail. This will be seen at a glance, and as a window case does not require a great body of air admitted into it, it will be sufficient, but of course the upper part of the window will be open at the same time. There are, however, many advantages possessed by a completely independent and portable case, similar to what is known as a Wardian case. One of these is that the case and its contents may be removed bodily to any position, may be placed outside the window in summer, be kept inside in cold weather, or removed to any apartment where sufficient warmth may exist to suit the requirements of its occupants. In this way even tender or hothouse plants may be cultivated, with care, without any troublesome and costly heating apparatus being required.

Plants for Window Cases.—In considering the class of plants suitable for such glazed cases, it may be mentioned that such things as Pelargoniums, Fuchsias, and others of the same character may be kept in them for some time, and would be preserved in beauty longer in this manner than if exposed to the air, but could scarcely be continuously grown in such a situation, except perhaps Fuchsias, which would do well with care; but it is preferable to grow such plants as require but a small amount of air, for the more air you admit the more soot and dirt comes with it, so that we advise a selection to be made from the following list, all of which will do well, though they will require some considerable amount of care bestowed upon them in such confined quarters, and under such artificial circumstances. All are effective and pretty, and some extremely beautiful.

<i>s Achimenes</i> , in variety	<i>Fittonia argyroneura</i>
<i>Æschynanthus</i>	<i>Pearcei</i>
<i>Alcasias</i> , in variety	<i>Verschaffeltii</i>
<i>s* Anthurium Schertzianum</i>	<i>Gloxinias</i>
<i>Aralias</i> (small)	<i>Isolepis gracilis</i>
<i>s Begonias</i> , both <i>Rex</i> kinds (ornamental foliage), and <i>Tuberous</i> (flowering), but former best	<i>Maranta rosea</i> , <i>picta</i> , and other dwarf kinds
<i>s Caladiums</i> , dwarf kinds	<i>*Mimosa pudica</i> (Sensitive plant)
<i>Cephalotus follicularis</i> (New Holland Pitcher-plant)	<i>Nertera depressa</i> (coral plant)
<i>s Darlingtonias</i> (Californian ditto)	<i>Panicum plicatum</i>
<i>s Dionaea muscipula</i> (<i>Venus' Fly-trap</i>)	<i>Reellia ciliata</i>
<i>† Dracenas</i> (small-growing kinds, such as Mrs. Bause)	<i>Sarracenia</i> (Side-saddle plants)
	<i>s Selaginellas</i> , such as <i>Krauseana</i> , <i>K. aurea</i> , <i>cassia</i> , and <i>apoda</i>

s Ferns.—The most suitable kinds for a case are:—

<i>Adiantum aethiopicum</i>	<i>Lomaria lanceolata</i>
" <i>affine</i>	<i>Herminieri</i>
<i>† " capillus-veneris</i>	<i>Niphobolus lingua</i>
<i>† " cuneatum</i>	<i>Onychium japonicum</i>
" <i>hispidum</i>	<i>Polypodium plumosum</i>
" <i>Sancta Catherinae</i>	<i>Polystichum triangulum</i>
<i>† Asplenium bulbiferum</i>	<i>Pleopeltis nuda</i>
" <i>flabellifolium</i>	<i>angustata</i>
" <i>monanthonemum</i>	<i>† Pteris crenata</i>
" <i>viviparum</i>	" <i>cretica</i>
<i>Davallia Novæ-Zealandæ</i>	" <i>serrulata</i>
<i>Doodia aspera</i>	<i>Todea pellucida</i> <i>cristata</i>
" <i>media</i>	<i>* superba</i>
<i>Lastrea acuminata</i>	<i>† Frichomanes</i> , of sorts
" <i>glabella</i>	

Palms.

<i>Chamærops excelsa</i>	<i>Corypha australis</i>
" <i>humilis</i>	<i>Rhapis fiabelliformis</i>
<i>Cocos Weddelliana</i>	

All those marked with an asterisk (*) will require extra care, and very careful cultivation, and will not succeed more than moderately well even with this, where the air is very bad. On the contrary, those marked † need only ordinary care, being vigorous and robust. The letter *s* denotes that the plant requires shade from hot sun at all times. Most of the above, with the exception of the ferns, most of which are proper to the greenhouse, and the Darlingtonias will require, or at least succeed well in, a temperature similar to that maintained in a stove. That is, an average of about 70°, say,

60° at night, and 75° or 80° in the day, at least during the growing season.

In addition to those named above, many orchids are very suitable for culture in a case, though these will require very careful culture, and unless considerable experience has been gained, many flowers must not be expected from them. But it is a fact that many orchids have been successfully flowered in window cases, even in the heart of London. Some of the Cypripediums will be found most suitable, such as *C. barbatum*, *insigne*, or *niveum*. These do best under moderately cool treatment. Oncidiuns may be taken next: such as *O. flexuosum*, *hastatum*, *tigrinum*, *zebrinum*, &c. Several of the Lycastes and Odontoglossums will also give good results if properly treated. A treatise might easily be written on the culture of Orchids alone; but we may mention that one great point in the successful growth of these is, not so much *to maintain* a light temperature as a constant humidity, almost amounting to saturation, in the atmosphere, during the whole season of their growth.

Planting the Case.—In planting the case plenty of drainage must be used at the bottom, over that a layer of Moss, and then put in the soil. A very good compost that will grow Ferns, Palms, Begonias, and most of the plants mentioned, may be made by mixing together about equal parts of loam, leaf-mould, and peat, with a fourth part of silver sand, and crocks or bricks broken up very small in equal portions. It is far more effective in planting a case, especially if of any considerable size, to arrange it more in the style of a rockery—that is, by piling and fitting together in a graceful and natural manner some pieces of roughish stone, to form a picturesquely rugged mass of porous materials in the bottom of the case in such a manner as to leave a number of holes or fissures at convenient points, which may be filled with soil, and the plants selected placed in these. When planted give a good watering, always using tepid water. With care in watering, aération, &c., for the future, the case will last for years. In time, however, if they live and do well, some of the plants mentioned, such as Palms, &c., though only the dwarfest kinds are enumerated, will attain such a size as to be inconvenient; they should then be removed, and replaced with small plants.

Heating, &c.—Of course where greenhouse ferns, or indeed any of the plants given in the preceding list, are grown, either some means of heating the case must be resorted to in winter, or the plants must be altogether

removed to some place where they can receive the requisite amount of heat, though in the summer nearly all those named will do well without any artificial heat—that is, from the 1st of June till the 1st of October. Many handy little apparatuses for heating such cases can now be purchased, and almost any simple arrangement of hot-water pipes, heated by a suitable lamp, or burner, or boiler, would give the desired result. But the heat, though small in quantity, must be constant and regular, or it will be as bad or worse than none. In a large structure like a greenhouse it does not much matter if the fire goes out for a few hours, even in severe weather, as the quantity of water in the pipes, the mass of brickwork, and the contents of the house all maintain the heat for a long time. When the contents and all surroundings, however, are on such a small scale, it becomes a very different matter, and if the supply of heat be interrupted even for an hour in severe weather serious results will accrue. Yet only a very small amount of heat is needed, and we think that about the best arrangement is a couple of coils of strong tin or copper pipe, 1-in. or $1\frac{1}{2}$ -in. in diameter, running round the sides of the case, with the usual appurtenances of air-pipe, tank, &c., on a suitable scale, a boiler holding two or three quarts, or perhaps more for a large affair, and a good paraffin lamp and burner, properly arranged, and constructed to burn eight or ten hours without attention. Even with such an apparatus, however, great care is requisite, especially in the matter of watering; and in actual frost, if the glass is in direct contact with the outer air, and any of the plants within either touch it or approach within two or three inches of it they are very liable, in fact almost sure, to be injured, so that some protection or covering becomes necessary. Nothing is better than an old soft blanket or rug, or any kind of cloth, if thick enough, would serve the purpose, and it should be spread well over the outside of the case at night, and in the daytime too if the frost holds. A thermometer should be employed, and the temperature should range from 55° to 65° during the winter for most of the subjects mentioned. The heat should be greatest in the daytime, especially on a bright day when the sun is shining, and least at night. If it drops to 50° at night no harm will be done, but it must not be more than a degree or two less than this at any time, and 70° or 75° for a short time at midday in sunshine will be beneficial. In summer the heat may be allowed to rise to 80° or 85° during the daytime, but not more; and 65° to 70° at night will be suitable.

Unheated Cases.—Where the case cannot be heated in any way, and there is no convenience for keeping the plants elsewhere during the winter (if there is, it is better to grow as many of the things in pots as may be, so that they may be removed to their winter quarters without being disturbed), the only alternative is to fall back upon hardy plants. There are many of these suitable, and almost any plant that is found flourishing in damp shady woods or lanes, or near a waterfall or stream, will do well in a case.

Hardy Plants for Case.—Ferns and Mosses should form the principal subjects, and of the former the following will be found the most suitable for a case, especially if small.

* <i>Adiantum capillus-veneris</i> (Maiden-hair)	<i>Lastrea emula</i> and <i>montana</i> (Buckler Fern)
- <i>Asplenium adiantum nigrum</i> (black Maiden-hair)	* <i>Polypodium dryopteris</i> (Oak Fern) ,, <i>phegopteris</i> (Beech Fern)
<i>Asplenium trichomanes</i>	,, <i>vulgare</i> (common Polypody)
,, <i>marinum</i> (Sea Spleen-wort)	* <i>Polystichum aculeatum</i> and <i>angulare</i> (Prickly Shield Ferns)
<i>Athyrium filix-femina</i> (Lady Fern)	<i>Scolopendrium vulgare</i> (Heart's-tongue Fern), var. <i>crispum</i> , <i>multifidum</i>
* <i>Blechnum spicant</i> (common Hard Fern)	* <i>Trichomanes radicans</i> (Brittle Fern)
<i>Ceterach officinarum</i> (Scale Fern)	
* <i>Cystopteris fragilis</i> (Brittle Bladder Fern)	
<i>Hymenophyllum tunbrigense</i> (Filmy Fern)	

Those marked * will need very careful cultivation to do well. Other kinds of Ferns, such as the common Male Fern, *Lastrea Filix-mas*, the *Osmunda*, and other large growing kinds may be used in a small state, or in a large and tall case, but in the majority of cases they are unsuitable from their great size. The lovely New Zealand Fern *Todea superba* has been proved to be hardy under glass, and a plant or two may be tried, but care must be taken to procure one that has been used to cold treatment, and very great care will be requisite in cultivation. This, however, will be amply repaid if the Fern does well. A plant or two of small-leaved Ivy does well in a case—at least in winter, and is a great relief to the monotony of Ferns; the common ground Ivy is as good an one as can be had for such a place, though some of the silver variegated kinds are very handsome. The almost endless varieties of Mosses to be found in our English lanes and woods are another valuable resource; some of the *Lycopodiums* or Club Mosses are really handsome and effec-

tive. Several of the *Equisetums*, or Water Horse-tails, are effective and easily grown. Three of the most suitable kinds are *E. palustre* (the Marsh Horse-tail), *E. pratense* (the Shade Horse-tail), and *E. sylvaticum* (the Wood Horse-tail). The lovely little Sundew, too, or *Drosera*, that is so common on marshy heaths in Surrey and other counties, forms a very interesting subject; so does the flowering Buck Bean; and, in fact, almost any of the numberless plants and flowers that are to be found, and evidently luxuriate, in moist and shady situations, will be suitable for the town window case, and an expedition into some part of the country where these situations abound will be amply repaid.

We have sometimes seen the case so arranged by having the tray at the bottom made somewhat deep so that a foot or so of water could be introduced, and so form a kind of aquarium combined. Rough stones or rocks were built up at the sides or ends till above the surface of the water; in these and amongst them interstices were provided, which were filled with suitable soil, and plants, Ferns, &c., placed in these. In such aquarium cases the Cape pond weed (*Aponogeton*) and *Sagittaria variabilis* will succeed, also the pretty little *Valisneria spiralis*; while a few gold-fish, or even stickle-backs, and water plants in their natural element below the graceful arching leaves and fronds above, made a most charming picture. All this can be done in any London window, though not without trouble, and a good deal of it, too, in the first arrangement, as well as some expense; but when once done, and done well, it will last in beauty for years with proper attention and management.

In summer, if the window is at all sunny, some shade must be provided for nearly all the subjects mentioned. Some light material, such as calico, is suitable, and it should be arranged on a roller, so as to be easily brought into use, and be drawn up again when required.

WINDOW PLANTS.

We will now take some of the plants most suitable for window culture in towns, in alphabetical order, and give the best method of treating each.

Abutilons.—These soft-wooded plants are extremely handsome, the foliage being very elegant, and in some species beautifully variegated; the flowers are bell-shaped, large,

and some of them veined. These plants will grow well anywhere, but we find that they are very shy of flowering in smoky or very thickly populated districts ; however, some of the more free blooming kinds may be induced, with care, to produce at least a few flowers in almost any situation, and the variegated ones are fine anywhere. Of these the best is *A. Auguste Passegold*, but *A. Thomsoni* and *vexillarium fol. aureo-marmorata* are also good. *A. Darwini tessellatum* has a stately habit and beautiful foliage marbled with gold and green, and *Megapotamicum* is pretty where a trailing or climbing habit is desirable. Of the flowering kinds the following are the best :—

- | | |
|--|---|
| <i>Anna Crozy</i> (lilac, dark veins) | * <i>Insigne</i> (igneum), dark purple-crimson) |
| * <i>Boule de Neige</i> (snow-white) | <i>Le Grelot</i> (pale rose, veined) |
| <i>Darwini grandiflorum</i> (orange, dark veins) | <i>Lemoinei</i> (pale yellow) |
| * <i>D. robustum</i> (orange-shaded rose) | * <i>Louis Marignac</i> (pale lilac) |
| <i>D. tessellatum</i> (variegated leaf and free flowering) | <i>Louis Van Houtte</i> (dark purple, white throat) |
| | <i>Perle d'Or</i> (primrose and rosæ-florum) |

Those marked * are extra fine and desirable.

The most suitable soil for these is loam and peat in equal parts, with a fourth part of leaf-soil and a good proportion of silver sand. Prune in spring, and keep dry at the root and close till broken again ; then re-pot, but it is better to keep the plants dwarf and bushy by frequent pinchings during early summer ; in the autumn let them grow freely, and the flowers will appear in spring. When the roots get matted round the sides of the pot, shift into others 3 in. or 4 in. larger. Give plenty of water when in full growth, and keep dry through the winter.

Acanthus latifolius ; a very handsome plant with large robust leaves and dwarf habit. It will grow well in any light loamy soil, moderately rich. It is quite hardy.

Amaryllis purpurea (*Vallota*) (the Scarborough Lily). — This is a splendid window plant. It is very well known, but for the benefit of those who are not acquainted with it we may state that it is a bulbous plant, having long, narrow, and arching leaves of a deep green, and spikes of brilliant deep scarlet flowers, which are produced in autumn. The most suitable soil is a compost of two parts good loam, with one part each of sandy peat and leaf-soil, and a small portion of silver sand. Pot the plant so that the bulb shall be buried in the soil to one-half its depth only. Pot firmly and afford sufficient drainage. A 5-in. pot is quite large enough for a

good-sized flowering bulb, and larger pots should only be used when there are more than one bulb in a clump. Re-pot only once a year, and this should be done in spring. Be careful not to disturb the roots more than you can help, and never shift a plant into a larger pot until the last is crammed full of roots. This plant requires a sunny window to grow in or it will not flower. If the flower-buds do not appear by August, keep rather dry for a time, which will generally induce them to show. The offsets that appear may either be detached (potted separately in small pots and shifted as required, they will flower in three or four years) or they may be left undisturbed and the whole shifted on gradually into large pots, and in time this will give a mass of flowering bulbs, producing a fine effect, but for windows we prefer single bulbs, or at most two or three in a pot. Keep dryish during winter and water plentifully when in growth and flower.

Aralias are handsome foliage plants, well worth a little care and trouble. *A. Sieboldii* and its variegated forms are about the most suitable for cool quarters, as most of this family need nearly stove heat. These are of upright habit, with drooping foliage. They should always be grown with a single stem; and when this gets too tall cut it down and put in the top, as a cutting, allowing the old stem to break into fresh growth, when each shoot may be taken off and struck. But to do this you need heat; in the absence of this sell or exchange the plant for a smaller one. Soil, the same as for the *Aspidistra*; water freely when in growth. *Grevillea robusta* is a handsome plant, very similar to the *Aralia*, and requiring the same treatment.

Aspidistra lurida, and its variegated form *A. l. variegata*, are about the hardiest and most useful of all room plants, more so even than that universal favourite the india-rubber plant. Grow in a pot, 6-in. is a good size, almost any sort of soil will do, but a mixture of sandy loam and peat, with a little leaf-mould, is best. Give plenty of water when in growth, in spring and summer, and let the sun act on the plants except when very hot and scorching; for though they will grow in constant shade, yet they will not be so hardy and strong.

Azaleas, see p. 160.

Balsams, see p. 162.

Bouvardias.—Very pretty and useful, but only suitable for outlying places. A sunny window is necessary. For culture, see p. 165.

Begonias.—There are a great number of varieties of these. Where only ordinary care can be given, *B. fuchsioides* and *Weltoniensis* are about the best, both in flower and foliage. There is also another kind (deciduous) which grows 3 ft. or 4 ft. high from old tubers, and which has rough hairy leaves; this is as hardy and free in growth as the other. There are also the ornamental-leaved or Rex varieties, which are very handsome, but only the hardiest of these will succeed in towns; the more delicate and beautifully-marked ones will not grow satisfactorily unless you have glass and plenty of heat. The new tuberous-rooted kinds (flowering) do fairly well with care. These must not be over watered, while the others will stand almost any amount when in growth. All those here mentioned are deciduous—that is, they die down in winter, losing both their leaves and in most cases stems as well. As soon as the leaves turn yellow and begin to fall withhold water gradually, and through the winter keep dry and safe from frost. They may be stowed away in any dark place at this time, but do not turn them out of their pots, or disturb them in any way, and do not let them get so dry that the corms or tubers shrivel. If the temperature of the place where they are kept does not fall below 45° or 50° in the winter so much the better. When they begin to grow in spring repot them, shaking away all the old soil, and replacing in pots only just large enough to hold the tubers with a little earth all round. If very old or too large, divide them into as many pieces as you like, leaving one or two eyes to each piece. Repot firmly in equal parts of loam and leaf-mould, with plenty of sand and drainage. Do not water too much till well in growth. Almost any light and open soil will grow the commoner sorts, but they will do better, of course, in the compost. All Begonias delight in a close, warm, and moist atmosphere, so that they are very suitable for a case, and most of them, especially the foliage section, require shading from strong sun. Nevertheless they will grow well in a dry room if well watered and kept clean.

BULBS.

Nothing can be better for town windows than these. They are better kept inside the windows, yet we have seen them very pretty just planted in good soil in the window-

box in November, and taken a little care of. We will take the Hyacinth first.

Hyacinths.—These may be grown either in pots or glasses, indoors. Pots are best, but the culture in glasses is so much cleaner and simpler that most people prefer it, so we will give directions for this mode first. A great point towards success is to get good bulbs, and to get them to work early. It is very little use not starting them till December. The end of September or October is the best time. Many good kinds can be purchased for 6d. or 8d. apiece, though you can give almost any money. The single flowering varieties give the best effect as a rule. Remember it is not always the biggest bulbs that produce the finest spikes of flowers; rather choose solid, compact, and heavy bulbs of a good shape, and having that beautiful satiny skin, not ugly, lumpy, and dirty-looking bulbs. Fill the glasses with clean soft water, and put a small piece of fresh charcoal into each. Put enough water in each glass to reach up to $\frac{1}{2}$ in. below the bulb, not enough to touch it; then put the glasses in a cool, moist (but not damp), and dark place; a sitting-room cupboard is good, but it must not be near a fireplace, nor be in any way close or stuffy. The best place would be in a box or dark frame out of doors, well covered up with mats or sacks. Here they may remain for six or eight weeks, until the roots have formed plentifully and the bulbs have well broken; but look at them occasionally to see they are all right. When the young crowns are 1 in. or $1\frac{1}{2}$ in. in height, give them a little light at first, but not too much, or the tender yellow leaves will be injured if the sun or any strong light gets on them. Accustom them by degrees to all the light they can have, and when the leaves are a deep green remove to a sitting-room window; a little warmth will bring them on quicker. Remove them out of the window on frosty nights, and stand on the chimney-piece, so that they shall not get bitten. If the water becomes at all fetid or unpleasant, change it, but not unless, and it will probably be kept sweet by the charcoal. Nothing now remains but to fill up the glasses with water as it evaporates, and to support the flower-stalk by a neat wire as it rises. Hyacinths and all bulbs do better in a sunny window than a shady one.

For Culture in Pots plant at the same time as for glasses. Put one bulb in a 5-in. or 6-in. pot or three in an 8-in. pot. Prepare a compost of about equal parts of loam, well rotted manure, leaf-mould, and sand. Put two or three good-sized

crocks over the hole, then a handful of spent hops or moss, and fill up to the top with the compost, only pressing it gently together. Make a hole for the bulb and put a little dry silver sand for it to rest on. Plant so that half the bulb shall be above the surface. Give a slight sprinkling just to settle the surface, but do not make the soil wet, and stand aside till the bulbs are quite dry, then prepare a level surface out of doors, choosing a warm sunny corner if possible, and, unless it has a flagged or paved bottom, put down 3 in. or 4 in. of coal ashes to keep out worms. Stand the pots close together on this, and heap over them 6 in. or 8 in. of tan, leaf-mould, spent hops, or cocoanut fibre refuse; take care that there are no worms in this. Have a piece of oil-cloth, or other waterproof covering, and spread this over the heap in wet weather, removing it when fine. Here they may remain for six or eight weeks, but look at them occasionally, and when the crowns are well started into growth and the pots full of roots remove them. Give light gradually and a little water, then place in a greenhouse or sunny window to flower. Give plenty of water, and manure water twice a week during growth.

Tulips should have nearly the same treatment, but put three, four, or five bulbs in a 5-in. pot, according to the size; the early sorts, as Van Thols, are the smallest, and the later ones larger. Tulips prefer a more loamy soil than Hyacinths. Plant the bulbs just below the surface, and treat as for Hyacinths.

Polyanthus Narcissus are pretty; treat exactly the same as Hyacinths, but give a more loamy soil, say three-parts loam, one leaf-mould, one manure, and sand as required. These may be grown in glasses the same as Hyacinths.

Crocuses make capital pots. Use 5-in., and put five to eight bulbs in each, in fact as many as you can squeeze in, according to the size. Only just press them into the soil, shaking a little soil between them afterwards. Soil as for Polyanthus, then cover up as for Hyacinths. These should be kept cool till the flower-buds show; never above 50°; they will not flower at all if you attempt to force them.

WINDOW PLANTS.

Calceolarias.—Full instructions for rearing these have been already given. Where only a few are needed they will

strike well under a hand-glass in a window or out-of-doors, or in a box covered with glass, in the autumn. September is the best month. Young plants are always best. Calceolarias should never be allowed to get dry, so as to flag, yet water carefully in winter. In spring strong plants may either be planted out in window-boxes or potted in 5-in. pots. In pots give the compost recommended for Geraniums, or it may be a little richer. Give plenty of sun, air, and abundance of water and liquid manure when in growth and flower. When pot-bound Calceolarias can stand having this stronger than would suit most plants. Be sure and keep these clear of aphis, or greenfly, as they soon become seriously injured if they are allowed to gain a footing.

Callas (Arum Lilies).—These are very handsome both in flower and foliage, and seem to do as well in the smoke and dirt of London or Leeds as in the suburbs. The chief point in their successful culture is to give them at all times a plentiful supply of water, also to keep the foliage clean by frequent spongings with tepid water, and as this is large and smooth, the operation is easily performed. The Arum Lily flowers in April or May as a general rule, but flowers may be had at almost any season by forcing, &c. By far the easiest and best way of keeping these plants in health is to turn them out of the pots, as soon as the blooms are faded, into a sunny border of deep, rich soil, and give abundance of water throughout the summer. By September or the early part of October the plants will have made fine growth, and should be taken up carefully and potted in 6-in. or 7-in. pots, according to strength. Use sandy loam with a little well decayed manure. Keep close, if you can, for a week or two, and then place inside a sunny window, not giving much water until the roots have begun to work round the side of the pots. Give manure water frequently as the flowers show in spring. This plan should always be followed wherever possible, but the plants may be kept in pots all the year round. In this case re-pot as soon as the flowers are over into 5-in. pots for single crowns, and they may be kept in these till flowering time, but if you want a fine plant and flower shift into a 7-in. pot in October. If the plant does not show flower by the end of March, keep rather dry, which will generally induce flowering, then water plentifully. But if the plants have made a good growth previously, there is not much difficulty in getting flowers. There is a variegated form of this plant, with the leaves spotted with creamy-white, like a Caladium. This variety is dwarfer than the type.

is extremely handsome, and the flowers, though smaller than the plain-leaved one, are even more freely produced. It is called *Richardia maculata*.

Camellias.—These are very suitable for window culture (inside), are very easily grown, and do well anywhere but in the very worst localities. A good strong healthy plant should be purchased, and a rather shady window will suit it best. The flowers are produced in March or April. The best time to purchase is in autumn, when the buds are well set. Water only moderately, and keep cool in an airy room, always, however, safe from frost, till the buds begin to swell, then water more freely, giving some good clear manure water at every other watering, but weak, until the flowers expand. This not only induces fine blooms, but causes the plants so treated to make a vigorous growth afterwards. Keep the leaves clean by frequent and careful spongings with tepid water, and occasionally sprinkle overhead. A warm room, if not too dry, will cause the blooms to expand sooner, but in winter they must be kept cool. When the flowers are past, the plants should have the warmest and most genial situation, with a somewhat moist atmosphere and shade from hot sun, in which to make growth. If you have a greenhouse remove them to it, as these plants need a warm temperature and moist atmosphere to make a good growth, but with care an ordinary room will do. Water liberally during growth, and sprinkle overhead as frequently as possible. Any potting is best done about June, but Camellias, when once established, only need potting every second or third year, as they are not rapid growers. If the drainage becomes clogged or out of order, however, turn the plants out of the pots, remove the old drainage and any worms or loose soil, arrange fresh crocks, and replace in a clean pot of the same size as the old one. Also, if not re-potted, scrape away as much of the old soil from the surface of the pot each spring as will come away without disturbing the roots, and replace with some fresh, sweet, and rich compost, pressing it firmly together. If the plant needs re-potting, turn out carefully, remove the crocks and any loose soil, moss, &c.; but be very careful not to break or injure the live roots in any way, as they are very brittle. Have a clean pot 2 in. larger than the old one ready, with plenty of drainage carefully arranged, and some fresh moss over it, then put in enough soil to bring the collar of the plant nearly on a level with the rim of the pot, and fill in soil all round, ramming it down hard and regular with a lath or flat piece of wood.

Remember that for these and all hard-wooded plants the soil must be made firm and solid, and no cavities or loose places left. Fill up to within $\frac{1}{2}$ in. or $\frac{3}{4}$ in. of the rim, leaving the surface rather higher in the centre than at the sides. Water with a rosed pot or syringe at first, to settle the surface. The best soil for Camellias is a very sandy peaty loam, with a little leaf-mould if the soil is not naturally very rich. Young plants seem to do best in nearly all peat, but as they get older and stronger require more loam. For moderate-sized plants, about two parts fibrous loam, two of peat, one of leaf-mould, and one of sand, with a little charcoal, would be suitable.

Campanulas.—These are very pretty, and succeed admirably. There are very many varieties, of which the following are the most desirable:—*C. Barrellieri*, a drooping kind, with a profusion of star-like, bright blue blossoms, hangs down about 1 foot, very suitable for suspended pots or baskets; *C. carpatica*, blue and white, very elegant varieties, growing about 6 in. high, with numberless blooms, extremely pretty, for pots either in or outside of the window, requires care in large towns; *C. grandiflora*, another drooping kind, but having far larger and more substantial flowers than *C. Barrellieri*, droops sometimes 2 feet, grand for hanging pots or baskets indoors; *C. pyramidalis*, erect and branching, as its name implies; in fact, greatly resembling a Canterbury Bell, only the blooms are much more opened and flattened. This variety may be successfully grown in pots for window decoration. Campanulas delight in a light, rich soil. Equal parts of loam, peat, and leaf-mould, with plenty of sand, suits them well. Do not pot very firmly, and give plenty of water when in growth and flower. Keep dry through the winter, and divide and re-pot in spring as soon as growth commences. The drooping kinds do best in slight shade. A 5-in. pot is large enough for the drooping kinds, and the pots should be suspended by means of wires, and the shoots allowed to droop over regularly all round. Use the same soil, but pot firmly for *C. carpatica*, and the tall pyramidal kinds, which grow 3 ft. high sometimes, should be treated in the same way; it is, perhaps, best to divide and pot these in autumn, and when getting pot-bound in spring shift into 6-in. or 7-in. pots. Use a more loamy soil and some old manure for these.

Cannas.—These are very handsome and free in growth. Plants cannot be raised from seed without considerable

heat, so that it is better to buy a plant or two; the usual price is 6d. each. We give them a light rich soil of peat, leaf-mould, old manure, and loam, with plenty of sand and good drainage. Keep in a sunny place, and give plenty of water and liquid manure. When the small pots are filled with roots the plants may be shifted on into larger pots, till 9 in. or 10 in. are reached, and in such fine plants 4 ft. or 5 ft. high may be had; but we have had beautiful plants which flowered and seeded in 5-in. pots, and 6-in. or 7-in. are quite enough for ordinary display. When they die down in autumn, stow away safe from frost, and keep dry; in spring, as soon as they begin to grow, re-pot, and, if needed, divide the roots. One drawback is that these plants are very late in starting into growth, as a rule, unless you can give them heat, so that we always prefer seedlings.

The *Cyclamen* is deservedly a great favourite. A good healthy plant once purchased will flower well for years in a suburban sitting-room, with only ordinary care. When the plant has done flowering, keep it rather drier, and during June, July, and August, they are better in a cold frame, or out of doors in a shady place, standing the pots on ashes or pieces of slate, to prevent worms entering. Keep only just moist until the flower-buds show, then bring indoors, and top dress with a little nice light soil. Unless they become unhealthy, these seldom need re-potting; they do not like their roots disturbed. To do well, they need all the light they can get, and should only be protected from the scorching sun of summer. We find them to do best in about equal parts of loam and peat, with a little leaf-soil and plenty of sand, though some recommend loam and leaf-mould only. The great secret, however, is not to meddle with them, but leave them alone, except to water of course, unless out of health.

Deutzias.—These lovely plants will not bloom in the heart of London, or any very thickly populated part, but in the suburbs will do well with care, or in any moderate-sized town. Indeed, in anything like pure air they will grow and flower well quite naturally. They should be induced to flower and begin to make growth as early as possible, and this latter should be assisted by plentiful waterings and syringings overhead, and the moderate use of liquid manure. Re-pot when they commence to grow, using good fibrous loam three parts, one part very old decayed manure, and a little silver sand if the loam is deficient in it, but not otherwise. Do not use larger pots than 5-in. ones; prefer young

plants, and prune back very closely after flowering, but do not re-pot till the plants have broken again. When growth is complete, say in August, plunge the pots out-of-doors in a sunny place, either in the ground or in a bed or box of cocoa-fibre, tan, or anything of that sort, and give but little water. This will harden the growth and induce flowering. In October remove indoors, and keep cool and rather dry till growth commences again.

Dracænas make fine room plants. Some of the hardier kinds, as Australis, Draco, Cooperi, &c., may be grown altogether in a warmish room, with care, but even these will be benefited by being placed in a warm greenhouse or stove, in spring or early summer, to make growth; and with the more tender kinds this will be absolutely necessary. They luxuriate in a compost of nearly equal parts of loam and peat, with a little leaf-soil, sand, and crushed charcoal. Keep them only just moist during winter, and water freely both at the root and overhead in spring and summer. The best for room culture are D. Australis, Cooperi, Draco, fragrantissima, indivisa, nutans, and Veitchii.

Ferns.—These are fine subjects for the shady window of a quiet room, but they will not do any good where a fire is often burning, or there is any draught or current of air. They do well in pots. These should be small, that is, as small as the roots will comfortably go in, for Ferns cannot bear a lot of unoccupied soil about their roots, at least when in pots. Use plenty of drainage, broken crocks, and pot firmly. Two parts peat, one part loam, and one of sand is a good compost; but some Ferns like more loam and some more peat. For moderate-sized plants, 5-in. pots are the most useful. Use the compost in rather a rough state, not broken up too finely. The following Ferns are suitable for window culture:—

HARDY FERNS.

<i>Adiantum capillus-veneris</i> (Maiden-hair)	* <i>Athyrium filix-femina</i> (Lady Fern), of this there are many elegant varieties
<i>Asplenium adiantum nigrum</i> (Black Maiden-hair Spleen-wort)	<i>Blechnum spicant</i> (Hard Fern)
* <i>Asplenium marinum</i> (Sea Spleen-wort)	<i>Ceterach officinarum</i> (Scale Fern)
* <i>Asplenium ruta muraria</i> (Wall Rue)	* <i>Lastrea dilatata</i> (Broad Buckler Fern)
<i>Asplenium trichomanes</i>	* <i>Lastrea filix-mas</i> (Male Fern) ", <i>montana</i> * <i>Osmunda regalis</i> (Royal Fern)

<i>Polypodium vulgare</i> (common Polypody)	of this there are many varieties, and <i>crispum</i> , edges beautifully crisped or fringed
<i>Polystichum aculeatum</i> (Shield Fern)	* <i>Scolopendrium marginatum</i>
* <i>Polystichum angulare</i> (Soft Fern)	" <i>multifidum</i> , fronds frequently forked or divided
* " <i>capense</i>	"
* " <i>proliferum</i>	* <i>Scolopendrium laceratum</i>
* <i>Scolopendrium vulgare</i> (Hart's-	

All are extremely elegant. Those marked * are especially easy to cultivate. These will all do in any shady window, and will stand a little frost in winter well, but they should be kept moderately dry at that season, especially deciduous kinds, such as the Lady Fern, with others. These hardy Ferns will do rather best in a more loamy soil than the more tender kinds; in fact, make the soil as nearly similar to that in which they are found growing naturally as you can. Of

Greenhouse Ferns, the following are good: *Adiantum cuneatum* and *A. Ridgworthii*, *Asplenium bulbiferum*, *Davallia canariensis*, *Davallia Novæ Zealandiæ*, *Doodia media*, *Lomaria gibba*, *Nephrodium molle*, *Niphobolus lingua*, *Onychium japonicum*, *Polystichum flexum*, *Pteris cretica*, *Pteris serrulata*, *Perenata*, *Albo lineata*, *Serinelata cristata*, &c.

The lovely *Todea superba* may be grown in a case or under a bell-glass, and with care many other greenhouse Ferns could be made to do well with either of these aids. But all these greenhouse kinds need great care to do at all well; but if you do not succeed very well at first do not despair, but be patient and try again. Ferns are slow-growing things, and especially slow in establishing themselves. Do not use too large pots, and do not overwater the Ferns, yet keep moist. Vigorous specimens in health and full growth may have plenty, so that it can always drain freely away, but with any that are not strong or looking well be careful, as too much moisture does more harm than good. You must have shutters or good thick curtains to keep the frost away from these in winter, for though most greenhouse Ferns will stand much more cold than most people suppose, yet actual frost will finish up the majority of them very speedily. In severe weather keep them quiet and dry, and only just take the chill off the water that must be used, whereas in summer, when they are growing, use it almost warm. Be sure and keep the foliage always clean by frequent sprinklings or regular washings in summer, though in winter the fronds should not be wet much, and the large-leaved sorts may be frequently

but very gently sponged. Keep the atmosphere of the room as sweet and moist as you can, consistent with not injuring the furniture, &c. From October to March we should prefer to move these ferns to a sunny window, if there was one available.

Ficus elastica (the India-rubber Plant).—This is a capital town plant; its leaves are so large, smooth, and leathery that they can be easily and frequently cleansed by sponging, &c. Give the plants a moderate shift into pots $1\frac{1}{2}$ -in. or 2-in. larger when required. Spring is the best time to perform this operation, just when growth is commencing. Provide good drainage, and use three parts of loam, one peat, and a little leaf-soil, with plenty of sand; make this rather fine, and pot firmly. Water pretty freely when in growth, but keep dryish when at rest. These plants are better under than over-potted; therefore, do not shift them unless they need it. Either a shady or sunny window is suitable. When pot-bound give weak manure water occasionally, if in growth. These cannot be propagated without heat. Cuttings of three joints taken off in summer, the lowest leaf removed, and planted in sandy soil in pots, tying the leaves together, and placing in a close frame or house with heat of 75° or 80° , or even under a bell-glass, will generally root freely; and every eye, taken off with its leaf, and treated similarly, burying about $\frac{1}{2}$ -in. deep, will make a plant.

Ficus Cooperi, very similar, but bearing large egg-shaped fruit, and **F. Parcelli**, with variegated fig-shaped leaves, are both desirable and suitable for town culture. In fact, all the Ficus or Fig family do well.

Fuchsias.—When full grown these are among the most beautiful of plants when in flower, and they are, as a rule, of very easy cultivation, but some amount of care must be bestowed upon them to produce good results in towns, though in the country they hardly ever go wrong with ordinary treatment. But all Fuchsias will not grow in towns, at least they will not flower, though all may be made to make a good leaf growth if treated right. But by far the greater number, and many of these, unfortunately, the most delicate and beautiful varieties, either hardly ever show a bud, or when just upon the point of opening these will nearly or quite all drop, in spite of all you can do, and you have nothing but leaves for your pains. Therefore, the first thing to do is to find out what kinds will not only grow, but flower freely, and keep their buds and flowers on firmly when they are shown. They may be grown either in or outside the window; in the

latter case taking them in, of course, on the approach of winter.

Varieties.—Of course all the fine-foliaged kinds, such as Sunray, Cloth of Gold, Meteor, &c., can be done very well, but the colours do not come out quite so bright as in purer air; nevertheless, they often look very well. These fine-leaved Fuchsias do better in pots under glass or in a sunny window than planted out; the soil must not be too rich, nor more water than is needed to keep the plants growing be given, or the colours will suffer, and the heads should have as much sun as possible. Of flowering kinds, we can confidently recommend the following: Daniel Lambert, very free flowering variety, with red flowers, not very good colour or shape, but a great favourite, and suitable for town culture. Mrs. Marshall, a fine old kind, flowers large, waxy white sepals, bright rose corolla, graceful drooping habit. Mrs. Welsh, similar to above, but corolla more intense in colour. Sedan, bright crimson self-coloured flower, corolla opening *à la crinoline*, graceful drooping habit, and without doubt the finest town Fuchsia. Try Me O! fine dark kind, dwarf and stiff in growth, a great favourite. Pink Perfection, Earl Beaconsfield, and Wave of Life, are also good. Elegance and Charming are two fine dark kinds of very vigorous growth; they do well with care.

There are a few others that will do well and give more or less flowers with care, and if the plants receive no check, but they are not to be depended upon, especially where the air is bad. Strange as it may appear, we have had a few fine blooms from the beautiful double white corolla Lucy Finnis, but if you let many blooms come on at once, down they come. It is far better to thin the buds to four or six on a plant than have them all drop. The flowers of this variety are so enormous that even a couple are very effective, and no plant can carry a great number at one time; even in the country they either drop or come small. Mrs. Bennett, a very fine single white and an extraordinary free flowerer, does well with care, and so does Vainqueur de Puebla, another good double white. Also Tower of London and Purple Prince, a splendid thing. We have had a few blooms occasionally from Avalanche, but the same remarks apply here as to Lucy Finnis. These are about all that will do well in smoky districts. It is no use attempting the more delicate kinds, and it is strange, but as *a rule* the newer varieties seem to hold their blooms much better than the old ones, for we could hardly ever get even a single flower to stay on and open of such kinds as Venua-

Victrix, Dr. Jephson, Marquis of Bristol, Rose of Castile, and the like, though plenty would show. Old Fuchsias flower more freely than young ones, though the individual flowers are not so large.

Raising Young Plants.—Young side shoots, about 3 in. long, taken off with a heel any time in summer, will strike freely in pots of leaf-mould and sand under a bell-glass, or in a case or close frame, or glass-covered box. Use the leaf-mould and sand in equal parts, provide plenty of drainage, and put about six cuttings in a 3-in. pot. Shade from sun, and, when rooted, pot off singly in 3-in. pots, using the same soil with a little loam added. These plants, kept through the winter, and shifted as soon as they begin to grow into 5-in. pots, using three parts loam, one of leaf-mould, one of old rotten manure, and some sand, will make a fine show during the summer or autumn, or they may be planted out into outside window boxes.

Training.—Some kinds are naturally stiff in growth, and make fine pyramids. These should have a neat stake put to them when needed, and be tied neatly to it, but do not tie tight, or you will check the flow of sap as the stem swells. If the plants do not shoot out sideways when 6 in. or 8 in. high, pinch out the top; this will induce the formation of side shoots. Train the uppermost upright, and when it has grown 6 in. or 8 in. more pinch out again. This plan will produce a fine pyramidal shape, and, if needed, the shoots may be tied out to neat stakes stuck in the pots so as to form a regular specimen. When the pots in which they are to flower are pretty full of roots give weak liquid manure two or three times a week. Such kinds as Mrs. Marshall, The Crinoline, &c., have a naturally drooping and straggling habit of growth, and it is usual to train these on to a flat trellis, or loop up the main shoots loosely to a central stake, but if only one shoot is allowed to develop itself at first, and this is carefully trained upright, and the side shoot carefully encouraged and disposed, a very good pyramid may be formed; but even then they will droop more and require more support than the stiffer-growing kinds. If on a flat trellis, keep one side constantly to the light, but if of a pyramidal or tree shape turn the plant round frequently, so as to balance the growth. The tree shape is very pretty for Fuchsias. It is formed by allowing only one shoot (the strongest) to rise; tie this to an upright stake and pinch out all side shoots. Do not stop or check it at all, but let it run up, taking out any flower-buds as soon as they show, to a height

of $1\frac{1}{2}$ ft. or 2 ft., or more if required; then pinch out the top, and when three or four shoots at the top have got 3 in. or 4 in. long, pinch these again, and so on until a good bushy head is formed, without a sign of growth from the lower part of stem; then let it flower.

Situation.—Fuchsias will both flower and look much better if kept in a shady window, at least in late summer and autumn, and especially if placed outside, as they are very apt to flag and shrivel in hot sunshine, and then the blossoms are very liable to fall; besides, the flowers develop more perfectly in the shade and last much longer as well. Yet in winter and spring it is better for the plants to have as much air and sun as they can bear, so as to harden the wood and lay the foundation of a plentiful bloom by-and-by. The Fuchsia delights in a moist atmosphere when in growth, and is greatly benefited by frequent syringings or sprinklings overhead, like a fruit tree. They are extremely impatient of checks and draughts, so that, to do well, the plants, from the time they begin to grow till in full flower, should never be allowed to want for water, or be too much cramped at the root, or suffer in the least from green-fly or any other insect pests. They should never be moved suddenly from a cold to a warm temperature when in growth, or *vice versa*, and when grown inside a window it is better not to open the sash at the bottom at all, but give air at the top throughout.

Treatment after Flowering.—When done blooming in the autumn, stand the plants, or plunge them, in a sunny place, and gradually withhold water. Keep dry, but not so dry as to allow the stem to shrivel, through the winter, and the plants may at this time be stowed away in a cellar, or any dark place safe from frost. Shorten back the shoots a little in autumn, and when they show signs of growth in spring prune back pretty closely, more or less, according to what you want; do not disturb them, but give a little air, light, warmth, and moisture, and when the shoots are $1\frac{1}{2}$ in. long re-pot into as small pots as they will go, shaking away most of the old soil. They may be either flowered in these or shifted on again as often as you like up to the end of June, but if moved after that will not flower much that year. Old plants in very large pots need not be re-potted every year; a good top-dressing in spring is sufficient, and use plenty of manure water afterwards.

Geraniums (Zonal Pelargoniums).—These are the most easily cultivated of any class of plants, and also are among

the most showy. Few diseases and no insects attack them. They require very little attention, and once potted and watered occasionally, a good plant will continue in flower from May to October anywhere, and with a little care you may have plants in bloom for even a longer period than this.

Varieties.—There are now innumerable varieties of the zonal Pelargoniums, with colours embracing every shade, from purest white to deepest crimson, and even purple and yellow are now very closely approached. For ordinary purposes the fine old bedder Vesuvius, with scarlet flowers, is one of the best, as it is extremely hardy and free flowering, and possesses a splendid habit of growth, which is more than can be said of some of the newer ones. Some of these are certainly magnificent, the single flowers or “pips” being often 2 in. to 2½ in. in diameter, and the heads of bloom 6 in. to 8 in. over; but they must have very good cultivation to do anything like this, and you cannot expect to get them quite so fine in a town. Still, we have had some fine blooms in about as bad a place as could be. A few really good ones are:—

Singles.

Génée (scarlet, white eye, dwarf habit)	Kleon (fine scarlet)
Aphrodite (magenta, very large)	Leviathan (salmon, very large)
Atala (bright orange-scarlet)	Lizzie Brooks (rosy-scarlet)
Circulator (rose-scarlet, immense truss)	London (scarlet, very large)
Commander-in-Chief (crimson-scarlet)	Miss Knight (fine pink)
Correggio (purplish-crimson, large)	Mr. Parker (purple-scarlet, dwarf)
Dante (fine purple-pink)	Mrs. Strutt (fine light purple-pink)
Fanny Catlin (rosy-salmon, immense)	Polyphebus (soft scarlet, large white eye)
Hettie (magenta, a grand variety)	Tom Bowling (orange-scarlet, grand)
H. M. Pollett (deep crimson, white eye)	The Spencer (soft scarlet)
	White Clipper (fine white)
	White Vesuvius (white, very dwarf, and free)

Doubles.

Candidissima plena (white)	La Constitution (orange)
Charles Hovey (blush)	L'année terrible (scarlet)
C. H. Wagner (purple-crimson)	Littré (purple-pink)
Compte Rampon (scarlet)	Lucie Lemoine, white
Duchess of Connaught (white)	Marie Lemoine, rose
Emile de Girardin (rose colour)	M. Gelein Lowagie, orange-scarlet
Grand Chan. Faideherbe (deep crimson)	

Jealousy is such a high salmon-colour as to very nearly approach to yellow, and Guinea is a shade or two nearer still. Dr. Denny is quite a bluish-purple, with a bright scarlet spot at the base of each of the upper petals. Besides these, there are bluish-white, rose, pink, magenta, carmine, and an almost infinite variety of other shades too numerous to mention. There is another class of these favourites which are known as Hybrid Nosegays; these carry enormous heads of bloom, and are very intense in colour. A few good ones are: Dr. Rawson, Henry Jacoby, Charles Schwind, Samuel Plimsoll, and Titania (Pearson's).

Soil.—Geraniums will grow and flower well in almost any soil that is at all worth the name, but if really fine specimens are desired a suitable compost should be employed. About the best is, say, three parts of fibrous loam, with one part of well-decayed manure, a little leaf-mould if the loam is at all heavy or stiff, and some coarse sand. If the loam is rich use only a little manure; if poor, use more; and if you can get some rough grit or road scrapings, and substitute one part of this for one part of the loam, the plants will do all the better. Always pot firmly.

Propagating.—Cuttings of Geraniums should be struck in autumn. They will strike well in a cold frame or sunny window in August or September, but where a quantity is wanted, as for bedding, the easiest plan, where cuttings can be got so early, is to prepare a bed in an open, sunny situation by digging it over, working some nice leaf-mould in the top, then rake it level and fine on the surface, removing all large stones, clods of earth, &c.; make holes with a dibber 3 in. or 4 in. apart in rows all over the bed, and pour a little silver sand into each hole for the cutting to rest on. Having prepared a sufficient number of good, stocky, well-hardened cuttings (those from pot plants are preferable), put one into each hole, pressing the soil firmly round it, then give a good watering with a rosed pot, and leave them alone till the end of September, when they will be found to be well rooted, and should be carefully lifted and planted singly in large 3-in. pots, and in these they may be kept till spring, but the cuttings put in in autumn make the best plants always.

Treatment in Winter and Spring.—They should be kept through the winter on a greenhouse shelf, or in a sunny window, or anywhere where there is light, air, and enough warmth to keep the frost away. Give only just enough

water to keep them fresh, especially if the temperature is low. If you have several cuttings in a pot do not pot them off separately until the sun begins to have some power, say in March—that is, unless you have warm quarters—an stove, or viney, or a warm greenhouse to put them in for a time after potting. Pot off singly in 3-in. pots, using the compost mentioned, or any good soil; pot moderately, but not hard. In April or May, when these get full of roots, shift them into 5-in. pots, and when rooted out in these give a fair amount of water and let them bloom, for if you want fine heads now all buds should have been picked off previously. Give manure water twice or thrice a week when in or coming into flower. The old fashion of starving Geraniums is now quite exploded, and hardly any plant gets so soon dry or needs more water when in bright sunshine than these.

Treatment of Old Plants.—When the plants have been blooming for some time and are getting exhausted, harden them by standing out of doors in full sunshine, and giving only a little water for about a fortnight. Then cut all the long shoots down to within 1 in. or 2 in. of the base (the tops of these will make splendid cuttings), and put the plant in a close frame, if you have one, or in any quiet, warm, and shady place, still giving very little water at the root, though an occasional sprinkle overhead is beneficial. When the young shoots appear give a little water, and when they are 1½ in. long turn the plants out of the pots, shake away most of the old soil, and re-pot into as small pots as the roots will comfortably go in. Keep close and the soil dryish until the plants are rooted out and begin to grow, and then treat as for an established plant. Note that this pruning can only be done in spring or summer. Old plants thus treated bloom more freely than young ones, though the blooms are not so large, and these plants that have been cut back are far better for very early or late or winter flowering. To keep up a succession of bloom pot about three sets of plants during the year, say in March, July, and September.

Plants for Winter Flowering.—For flowering in winter (and in the dry, warm air of a sitting-room or kitchen Geraniums often flower far better than in an ordinary cool greenhouse at this season) the plants must be specially prepared. Old plants that have been cut down and started afresh, as above described, in spring or early summer are best; when growing again they should have been plunged in the open air either in tan or some open material, or in

the ground in any airy position exposed to the full blaze of the sun, only a little water given, and all flower-buds picked off as soon as they show. This treatment makes the wood very firm and hard, and if the plants are moved into a warm greenhouse or sunny window (inside) and a fair amount of water, a little liquid manure, and plenty of air on fine days be given them they will burst into splendid bloom, and continue in flower far into the winter and sometimes right through till spring. Good plants of Geraniums will flower much finer in summer if in a shady place so that they have plenty of light and air. The variegated zonal tricolor Geraniums will not do any good in a large town, though some of the hardier gold and bronze or silver (bicolors) give fair results with care.

Genistas.—Pretty dwarf hard-wooded plants, with a profusion of sweet-scented yellow flowers in spring; these are universal favourites. In anything like bad situations these cannot be *grown* at all successfully, though they may be kept in fair health for a year or two. In common with all other hard-wooded subjects these should never be allowed to get dust dry, nor at any time be deluged with water, though when in growth and flower they will need liberal supplies. After flowering keep rather dry, and expose to sun and air. Shorten back the long shoots, or prune as needed, then place in a greenhouse or close pit, or in any warm and shady place till fresh growth has been made. Encourage this by gentle syringing overhead at first, giving plenty of water at the root as well when a good growth is being made. If needed re-pot when the young shoots are about an inch in length, using good sound loam with a little decayed manure or leaf-mould. Towards autumn harden off and ripen the wood by free exposure to sun and air, only protecting the pot, by plunging, from scorching heat. Keep safe from frost during winter.

Golden Feather (pyrethrum), very useful for boxes, &c., see p. 74.

Liliums.—These make splendid pot plants, and will do well anywhere but in very bad situations. It is usual to treat these as greenhouse plants, but if well attended to they can be grown well with no more convenience than a small piece of ground and a sunny window. The most suitable kinds for growth in pots are *L. auratum*, *longiflorum*, *lancifolium* and varieties. The two latter generally do rather better than the former; but if these are too costly, the common white garden Lily (*L. candidum*) and the Orange or

Tiger Lily may be treated in the same way. We recommend purchasing fresh bulbs every year, though if you have a bed to spare, the bulbs when they have once flowered in pots may be planted out, and will often do well for a few years afterwards. The time for potting is in October or November, and the plants will flower in late summer or autumn of the next year. Obtain good strong and healthy bulbs, and put three bulbs in a 9-in. or four in a 11-in. pot, or one strong one in a 7-in. Put good drainage in the bottom, over that a handful or two of old hops, cover the bulbs with 3 in. or 4 in. of soil at first, and for the present the surface of the soil should be 3 in. or 4 in. below the rim of the pot, so that the bulbs must be put in pretty low down. Use a compost of two parts rich loam, one each of peat, leaf-mould, and well-rotted manure, with sand as required, though they will grow well in either good peat or good leaf-mould alone. Pot firmly. Use the soil in a rather moist condition, and give no water till the stems appear above ground. When potted place in a cold frame or pit if you have one, or in a window. When the stems appear earth up with fresh soil till the pots are full, and when growing give a moderate amount of water. When the weather gets warm in spring, the pots are better plunged in a warm bed or border out of doors than standing free all round. As they advance give some liquid manure, not too strong, at every other watering. Just before the blooms open, remove to a window—a shady one will do—as the flowers will last longer than in the sun; of course the stems must be tied to neat stakes when required, so as not to get broken. We do not recommend these bulbs to be used again for pots, but as soon as flowering is over, turn them out into a sunny well-drained border of deep, light and rich soil, and cover up well in winter; the bulbs should be put in 6 in. or 8 in. deep. If they grow well and make fine clumps, you may take some of them up in two or three years' time and use them for potting, but it is a chance if they do more than middling.

Lobelias are extremely useful for boxes, hanging baskets, or pots; for directions see p. 67.

Lophospermum scandens.—A handsome climber, with purple flowers like a small Gloxinia. Will grow either in beds, boxes, or pots, in any good light soil. Propagate by seeds or cuttings, or by division of the roots, as it forms a perennial bulb or tuber, which is, however, only half hardy.

Maurandya Barclayana.—A very pretty slender growing

climber with white and purple flowers. There is also a white and crimson form of this. If planted out attains a considerable size, but will flower in a small state in a 5-in. or 6-in. pot. Plants from seed sown early will bloom the same year, or cuttings may be taken in spring. Loam, with a little leaf-mould, peat, and sand, will grow them well. Train up wires or strings. These will require care where the air is impure or smoky.

Mesembryanthemums.—Succulents, good for pots or rockwork; but we have found these very uncertain in bad places. Sometimes a plant will "take" and do well, another time it cannot be made to grow at all. They will, however, do well in suburbs. There is an almost endless variety; all prefer a light rubbishy soil, say equal parts of loam, peat, leaf-soil, sand, mortar, rubbish, and charcoal; they luxuriate in hot sunshine, and need very little water. A few good sorts are *M. cordifolium variegatum*, *conspicuum*, *caulescens*, *denticulatum*, *barbatum*, *depressum*, *compactum*, *minimum*, and *tigrinum*.

Mignonette.—This is a very favourite window plant, and deservedly so. By far the simplest way is to sow where required in a box or boxes, and thin out when well up. Half a dozen good plants will fill an ordinary window-box well, though more may be left, but they should not be at all thick when young. But to grow good pots of Mignonette is quite another matter, and requires care. The first thing is to consider what sort to grow, as the common Mignonette, which is of a rambling or straggling growth, will give but a poor result in a pot. Any of the new compact habited or "pyramidal" as it is called, will be suitable, but the best kind for pots in our experience is Miles' Hybrid Spiral. Mignonette does not like being transplanted, and indeed this cannot be done at all unless you have a close frame in which to keep the newly-transplanted seedlings in for a time; so that the best plan is to take as many 5-in. pots as you require (if for exhibition you should grow three or four times the number to be shown) in March or April, and prepare them by putting drainage carefully in each. Three or four crocks will be enough; over that put a good handful of decayed hops or manure; then fill up with a good rich soil—say two parts of rich fibrous loam, and one part each of well-decayed manure and leaf-mould, with a little sand. This should not be sifted, only well mixed; the bottom part should be pressed down pretty firmly, and the top left rather looser, but still gently pressed. Give a watering when the pot is

half or two-thirds full, but leave the top nearly dry. Have a little fine, rich, sifted soil for the top, and sow the seed in this, covering about one-eighth of an inch with the fine soil. About a dozen seeds of Miles' Spiral and four or five of a good pyramidal kind will be enough for each pot; cover with a piece of glass. When the seeds come up tilt the glass a little, and remove it by degrees as the seedlings strengthen. Do not give any water till the seeds have germinated, unless the soil becomes very dry. If properly treated none will be needed, as the subsoil was well watered, and this will rise under the glass. Now observe that it is of the greatest importance that from the time the seedlings appear above ground the pots must be kept in as much light as possible and close to the glass, be this frame or window. They should be kept altogether under glass until the end of May; indeed, it is better in a smoky atmosphere to grow under glass from first to last to keep them clean. A cool frame, with the seedlings kept within 4 in. of the glass, and this kept clean, with plenty of air, is the best place for the plants to grow in; but a light sunny window, if the pots are kept close to it and turned round frequently, will do. If you have no frame, get one or two glass-covered boxes as a good substitute, and use these until the plants get too tall. As soon as the roots get to the sides of the pots these should be plunged in coal ashes, spent hops, cocoa-fibre, or something, as they will do much better so than left free, but it does not matter while the plants are small. When 1 in. high, thin out the plants to one strong one in the centre of each pot, if of the pyramidal kinds, or to six to nine of the spiral, leaving them regularly disposed, and only the strongest plants. Keep the soil always moist, but not wet for any time; give plenty of sun, and more and more air as the plants progress. If the plants are well grown they will not need any stakes, but should these be required they must be very small and neat, placed on the inside of the plants, and very carefully set in, as the leaves are easily broken, and the loss of a few spoils the look of the plants. The pyramidal will branch out naturally; the centre shoot must be kept upright, and the lateral ones carefully disposed at equal distances all round. The spiral grows upright, and unless the top is pinched out does not shoot out laterally, at least not at first, and where there are several plants in a pot they look much better with only one main spike of bloom. When the pots get full of roots give weak liquid manure frequently; if these instructions are carefully followed out you will have such Mignonette as is seldom seen.

Where only one plant is required in each pot, it would be rather preferable to sow in 3 in., thin out to one plant, and when ready just shift on into 5 in. or 6 in. Of course larger pots than those mentioned—6 in., 7 in., or 8 in.—may be used if desired, but more plants must be used in each in proportion to its size. For later or earlier blooming sow later or earlier in proportion. For winter-flowering sow in August, and plunge the pots out of doors or in a sunny frame with abundance of air. Tree Mignonette should be sown in spring, shifted on, and kept growing, and in winter must be safe from frost.

Mimulus (Monkey Flower) makes a splendid window plant. Raise from seed as directed before. Keep them inside the window till the end of May, when they may be put outside or planted out into boxes. Either shade or sun will suit them, but in the latter case the pots must be protected. If in pots, pot singly in 3-in. or large 60's when big enough; fill the pots one-third full of broken crocks; put a little moss or spent hops on the top, and fill up with sandy loam and a little leaf-mould or any light soil. Plant firmly, and when they begin to grow and flower give abundance of water. Plenty of air and light must be afforded throughout.

Musk is everybody's flower; it will grow anywhere. Treat similarly to Mimulus, but the soil should be richer and not pressed so firmly. Musk does best in a close room or greenhouse; it cannot bear draughts or too much air, though it should have plenty of light. Give abundance of water always.

Myrtle (*Myrtus*).—There are two forms of this—the narrow or small leaved, and the broad leaved. We prefer the latter. These plants have aromatic foliage, which is very good for mixing with cut flowers, and white blossoms, also sweetly scented, which are produced in autumn. Use the same soil and treat similarly, on the whole, as for Abutilons, but they do not need so large shifts; one moderate shift each year is sufficient; and the only pruning needed is to pinch the young shoots when about 3 in. long in spring, especially the very strong ones, so as to keep the plants compact and bushy. Large plants of Myrtle may be stood out of doors in summer; give plenty of water and liquid manure occasionally when in growth, but keep cool, though safe from frost, and rather dry in winter. Young side shoots, taken off when 3 in. long in summer, and inserted in very sandy soil, will root easily under a bell-glass or in a close frame or box covered

with glass and shaded from hot sun. Put six or eight cuttings in a 3-in. pot.

Orange (Citrus).—These have very handsome foliage which, being large and smooth, can be easily kept clean. If you purchase a grafted and well established plant from a nurseryman you will have flowers as well as foliage; but you may obtain a very handsome plant, the flowers of which, even if it has any, will, however, be most likely poor and insignificant, by rearing one from the pip of a common Orange. Choose a fine large Orange, with good pips or seeds; it should be as ripe as you can get, and May or June is a good time. Sow five or six in a 5-in. pot with good drainage, and some good sandy loam and leaf-mould for soil. Put a piece of glass over the pot, and set in a warm place. When the seedlings have made a leaf beyond the two first or seed-leaves, pot two or three or more of the best off singly in 3-in. pots, using good drainage and the soil recommended for Abutilons. Water very carefully, as these plants cannot endure a wet or sodden soil, yet it must be kept moist. If you have a frame or case the plants would do better there at first until stronger. Keep the plant or plants clean and growing, and rather dry and safe from frost in winter; pinch back the main and any luxuriant shoot, so as to induce plenty of branches to form, and give a shift into a pot 1 in. or 2 in. larger when beginning to grow each spring; in three or four years you will have a fine glossy-leaved plant as handsome as a Camellia in the foliage. If you like you can graft it with a scion from a good kind, but this must be done in heat, so it is better to take it to a nursery to be done, unless you have conveniences yourself. When two or three years' old is about the time to perform this operation.

Pelargoniums.—These require almost identical treatment with Geraniums. They are extremely beautiful, and do well in towns. These plants should not, however, be subjected to a low temperature if possible in winter, certainly nothing below 40°; if 45° all the better. Some of the fancy kinds are hardier and more vigorous than the show varieties, and such should have the preference. Soil as for Geraniums, but it is better to have it sandier; and if the loam is at all stiff use a little peat, and substitute leaf-mould for part of the manure. Pelargoniums delight in freshly burnt coal ashes, and nothing is so good for the drainage of these (and they must have plenty) as a few clean cinders. Pelargoniums do not blossom so continuously as Geraniums, and in towns you can only get them in bloom from about the

1st of June till August, though in the country air they will often bloom in March or April. The point to be aimed at is to have your plants, either old ones or freshly struck cuttings, well started into growth before winter comes on, and to keep these slowly growing, with plenty of light and air and not too much water right through till spring, for the fineness of the bloom of these depends altogether upon a long and strong growth having been made previously. As soon as the plants have flowered, place them out of doors in the sun, withholding water, and when ripened cut back and start again as directed for Geraniums; the prunings may be put in for cuttings, choosing strong points about 3 in. long. Those with a "heel" or scrap of the old wood do best. They will need a bell-glass or glazed box to root in, and will strike better in coal ashes roughly sifted than in almost anything else. Pot off singly when rooted, and keep through the winter in small pots (3-in.), and shift on in early spring. As soon as the bloom buds show, or earlier if you have large plants in small pots, give weak liquid manure frequently. The dry air of a room suits Pelargoniums better than the moist atmosphere of most greenhouses, so that they are very suitable for house culture.

Petunias make splendid window plants, either inside a sunny window, in pots, or outside in either pots or boxes in shade or sun. Instructions for their cultivation have already been given. Young struck plants or seedlings do best, the flowers of old ones get so small. Autumn-struck cuttings may be kept through the winter, and shifted or planted out for summer blooming; but if plants can be kept growing through the winter, and the young shoots taken off and struck in gentle heat in spring, these will make the best plants. Where there are no frames, &c., this is hardly possible, of course, but we have described a very simple and inexpensive arrangement to meet this difficulty and others of the same character; or a batch of seedlings may be successfully raised inside a warm window with care. Sow the seed exactly as before described, keeping a sheet of glass over the box or pot until the plants are pretty strong; prick off and plant out in pots or boxes when 2 in. or 3 in. high. Whether in pots or boxes, they may either be tied up to neat stakes or allowed to ramble or hang over the sides in a natural manner. Planted near the edge of a window-box, *they will droop* over the front and give a fine effect. Petunias *do not require* much water, at least when planted out, but in *pots must always* be kept moist, or they soon flag, and in

boxes never let them want. They require a light open soil, but it need not be very rich, as they are naturally robust growers. In pots equal parts of loam and leaf-mould, with plenty of sand, is better than much manure, and in boxes this latter should be avoided, as it induces too rank growth. Give manure water to pot plants occasionally when pot-bound and in full flower, but not before.

Plumbago capensis.—This is a little known, but extremely elegant and desirable, plant. It is generally treated as a greenhouse subject, but we have proved that it will do well in a sitting-room window almost anywhere. A plant costs about half-a-crown at a nursery, though small ones can sometimes be had for less. Spring is the best time to purchase. If the pot is full of roots, and the plant just shooting out into growth, as it should be, shift it, if in a 3-in. pot, into 5-in. or 6-in., or if in a 5-in., into a 7-in., using two parts loam, and one each of leaf soil and sandy peat, plenty of sand, and no manure. Give good drainage and pot firmly, ramming the soil all round the old ball with a piece of lath. When rooted out give plenty of water, and sprinkle or syringe overhead occasionally. Stop all strong shoots when they have grown about 1 ft. up to the middle of June; if stopped later, the flowers will be few. Train the shoots, which are rather long and straggling, either out into a large flat trellis, or tie to strings or wires up the centre or sides of the window. A very good plan is to stick three or four neat stakes round the sides of the pot, and train the shoots round and round, gradually ascending as well. The plant will flower in August or September. It needs plenty of light and air. When flowering is over, shorten back all the long shoots to about half their length, and keep dryish through the winter. In spring, when the plant shows signs of growth, cut back all shoots to 2 in. or 3 in. from the old wood, and when started again re-pot. Cuttings of side shoots 3 in. long taken off in June or July, and inserted in pots in very sandy soil, will root readily under a bell-glass.

Primulas (Chinese) make capital window or room plants where the air is not very bad. They bloom profusely throughout the winter. Many complain that they damp off at the collar, but this is caused by actual frost, or more often by over-watering in too low a temperature. If watered freely, these should be in a warm greenhouse; in a cold room give but little. A good preventive is to put a few small lumps of charcoal or a heap of dry silver sand round

the collar of each plant, and instead of watering from above, stand the plants, when dry, in a pail of tepid water, half way up the pots *only*, for ten minutes or so. This moistens the roots and keeps the collar dry. For directions for raising, see page 192. The hardy varieties of Primulas, including the many forms of the common Primrose, and the Sieboldii, amoena, and japonica varieties, as well as *P. denticulata*, *minima*, *purpurea*, and others, are very suitable for culture in pots, on the sill or inside the window. A good sandy loam, with some leaf-mould, suits nearly all these. Keep always moist, except when at rest, and protect from hot sun.

Saxifragas are useful for pots outside. These prefer a shady position in summer, with abundance of water; in winter to be kept rather dry. Most of the kinds may be grown in this way, for the smaller sorts use the soil recommended for Mesembryanthemums; but for the stronger growing ones, such as *crassifolia*, *ligulata*, *pellata* (the umbrella plant), or *Wallacei*, use good strong loam, and feed with manure water when in full growth, that is, unless grown in very large pots. The flowers of many of these are very beautiful, and good for cutting.

Sedums (Stonecrops) and **Sempervivums** usually do well in pots or on rockwork. A light porous soil, such as that named for Mesembryanthemums, suits them well, and, as a rule, drought does not hurt them, though some Sedums do well rather moist. *Sedum spectabile* and *S. Sieboldii variegatum* seem to be the most easily grown in towns, but *S. anglicum*, *corsicum*, *glaucum*, *pulchellum*, and *Lydium*, are all good, of trailing habit; and *S. acre* and *acre aurea*, *hispanicum*, and many others, may be tried.

Of **Sempervivums (S. tectorum)** the common houseleek is the hardest, and will grow anywhere—on the roof of a house or shed, in a pot or anyhow almost, where it cannot get too much damp. *S. Boissieri* is good; *S. arachnoideum* (the cobweb plant) very curious (this one is not hardy). *S. arboreum* and *repens* both curious; and *calcareum*, *globiferum*, *montanum*, *arvense*, *spinulosum*, and many others, may be used for bedding.

Spiraea japonica.—This is a very elegant plant, with deeply cut fern-like foliage and spikes of small white flowers in spring, after the style of the common Meadow Sweet, to which it is a near relation. This plant requires good sandy loam and abundance of water when in growth, like the Arum Lily. It is well to set the pot in

a saucer of water when in flower in warm weather, as it should never get dry. Like the Arum, too, this plant is far better planted out in the open air in summer after the flowers are over. Turn out of the pots, dividing the roots if necessary, into a sunny border of deep, rich soil, and give good soakings of water in dry weather all through the summer. The Spiraea is hardy, and need not be taken up in autumn, though this may be done if desired early; but for spring blooming it is quite soon enough to take up and pot in 5-in. pots in January or February. When potted, take the plants to a greenhouse, frame, or window (inside); do not give much water till they begin to grow, then afford plenty, and give liquid manure as well when the flower-buds appear. Under ordinary circumstances the plants begin to grow in March and flower in May, but they may be had much earlier by forcing. *S. palmatum* is a handsome plant, with rosy crimson flowers; a more recent introduction, and very desirable. It requires the same treatment.

Stocks.—These are very sweet and pretty for the window or balcony. Instructions for rearing these will be found on p. 76. Proceed as directed there, and when strong enough—about 3 in. high—plant out 6 in. or 8 in. apart in the boxes. They may be also pricked out singly into 5-in. pots, or into 3-in., and shifted, but it is rather a difficult matter to grow good plants in pots. To do them well they should be plunged, and cold frames are best to grow them in.

Thunbergias are splendid climbers, only running about 4 ft., with a profusion of white, buff, and orange flowers; some with black eyes, which are very quaint and pretty. Plant in boxes, a few together, or 3 or 4 in a 5-in., 6-in., or 7-in. pot; they do best in a light porous soil, with good drainage. Most are annuals, and should be sown in heat in March or April, and pricked off or potted when 2 in. high. They will come up in a pot or box covered with a sheet of glass in a warm sunny window (inside) in May. A sunny, or partially sunny, aspect is desirable, and strings should be placed for them to cling to. They will grow and flower well almost anywhere.

Verbenas will only be planted out in boxes, when, if allowed to ramble and droop over the sides, or neatly pegged down, they will look very pretty. For directions see p. 79. The varieties *montana*, *teucrioides*, and *venosa* are suitable for growing in boxes, as well as the ordinary kinds.

Finally, we would call the attention of all window gardeners to the following rules:—

1. Always get good, strong, healthy plants to start with, and keep them in health by giving them good soil—something that they can obtain plenty of nourishment from. A well-fed plant is seldom attacked by insects or other diseases, which will often seize upon and kill a half-starved one.

2. Keep your plants clean by frequent sponging of the leaves of such as have these large and smooth enough for the purpose, and by syringing or sprinkling. Also free from insects by hand-picking preferably to fumigation with tobacco. A soft brush and a sponge we find extremely useful, and also a piece of pointed stick wherewith to dislodge solitary marauders. If the plant must be smoked, put it into a close box or cupboard, and burn a little tobacco paper in a flower-pot in it. This speedily destroys all green or black fly or aphid. Do not wait until a plant is a mass of insects : it is too late then, but as soon as you see the first insect, destroy it at once. *A stitch in time saves nine.*

3. Give little or no water to plants when at rest, especially in the case of deciduous ones, and plenty (but not too much) when growing and flowering.

4. Give your plants all the sun and air they can bear, but do not subject them to sudden chills, or changes, or draughts, and keep them from scorching sunshine in summer.

5. Train them in the way they should go while they are young, and

6. Do not kill your plants with kindness one day and neglect them the next, but treat them with constant and unvarying attention and care, and learn to love them, and they will amply repay you for all your trouble.

P A R T III.

GREENHOUSES.

Who loves a garden, loves a greenhouse too;
Unconscious of a less propitious clime
There blooms exotic beauty, warm and snug,
While the winds whistle and the snows descend.

COWPER.

READ what is written in general remarks at the commencement of this book, and you will see how advisable it is to have plants covered with glass in the dirty and smoky air of large towns, not only to keep them clean, but to create to some extent an artificial and more favourable atmosphere around them than is possible in the open air. We strongly advise any one who loves flowers, and has a small piece of garden, or a yard or flat roof suitable for the purpose, to put up a greenhouse or two, no matter how small, though the larger the better. Many will object to the expense, for you certainly cannot put up anything for much less than £5, and if you have to pay for labour as well it will be double that. But "where there is a will there's always a way."

Situation, &c.—A greenhouse may look east, west, north, or south, be in a gloomy yard, or on the top of the house—something may be found that will do well in it. We have known, where there was no other place, the small back yard entirely glazed over, and shelves put up wherever one would go. Glass is cheap, 100 ft. of good glass, cut to size, can now be purchased for 12s. or 14s. Timber is cheap also, if you go to the right place; and any man who can use a hammer, saw, and plane, and has some idea of construction, can put up a glasshouse of some sort almost single-handed. Where

a choice can be made, choose a good situation, this should be open, light, and airy, and exposed to as much sunshine as possible at all seasons. If you want a lean-to greenhouse, build against a wall facing as nearly south as may be, though east or west or almost any aspect will do. But the best and most useful kind of house is, in our experience, a low span roof running north and south, as then you get the full power of the sun morning and evening, just when it is wanted, and in the middle of the day the sun, being "end on," does not scorch the things as it is apt to do in a lean-to in summer. For winter-work, forcing, &c., perhaps a lean-to with a steep roof against a south wall is preferable, as you want the full power of the sun at that season. But you can do but little in the way of forcing in towns, there is not light enough in the winter, and town-grown plants are not strong enough to stand it.

Construction.—Returning to the span roof, a most useful size is from 9 ft. to 12 ft. wide and as long as may be desired, or can be afforded, with a walk down the centre, and a flat shelf or wide stage on each side. If the house is much more than 12 ft. wide it will be better to have two walks, and a stage down the centre for taller plants, the smaller ones to stand on the side shelves. The angle or pitch of the roof may be 45° or less, and the ridge-plate, or pole, need not be more than 6 ft. 6 in. or 7 ft. from the floor. The foot-paths may be sunk 1 ft. or so below the ground level, for economy's sake, as in this case there will be no sides to speak of, or only a few courses of brickwork, or a 9 in. or 12 in. plank, and no glass be used except in the roof and ends. It is a great advantage not to have any high shelves or stages, so that all the plants may be below the level of the eye, for if you have plants stuck away far above your head they are often missed or forgotten, and the climbing and reaching in some houses is fearful. Whereas if you have all your plants on a flat shelf or table, not more than 18 in. or 2 ft. above the floor, you can see at a glance if anything wants attention, can perform all watering, &c., far more easily, and, moreover, when in flower, plants are so much more effective on a level below the eye, than spread about on ladder-like stages where you often see more of the sides of the pots than anything else. Where the stages are arranged as recommended, it is a capital plan to fix a ledge, or board set edgewise, about 6 in. deep along the front, then fill up the bed so formed with *cocoa-nut fibre* refuse, moss, spent hops, or anything of that sort, and plunge the pots in this. This keeps the pots cool

and moist, defends them from the sun's rays, and does away with the necessity for such frequent waterings as pots that are standing free all round need. Besides, if the moss, &c. is kept always moist, it will greatly help to keep up a healthy humid atmosphere in the house, and such things as Primulas, Cinerarias, Azaleas, &c., will do far better on such a bed than on open shelves; but this plunging is not by any means absolutely necessary. All woodwork, rafters, sash bars, &c., should be as light as possible consistent with the requisite strength; also, use large panes of glass—not less than 12 in. wide, and 18 in. or 2 ft. long, is a good length. Of course, where there are schools and children, or a crowded street near and much stone-throwing occurs, it does not do to have very large panes, as it comes expensive to replace them. But on every other account have them as large as possible, for the dirt always collects at the laps and edges, and the fewer of these there are the lighter will the house be.

Hellewell's or other similar systems of glazing dispense altogether with putty, and greatly simplify construction, as well as producing a lighter and better house. In these there are only a few stout vertical rafters; these are crossed by horizontal iron bars, which take the upper and lower ends of the panes, which are secured in their places by metal buttons, and their side edges are merely "butted" together, so that a broken pane may be taken out and replaced in a few seconds.

The construction of these span houses is of the simplest. A few courses of bricks, or some strong charred posts (4 in. by 4 in. is a good size) driven in at distances of about 4 ft., and mortised into the wall plates, which should be 4 or 5 in. by 2 or 2½ in., makes a good foundation. Then all that is required is the requisite number of rafters (rebated) or sash-bars, a ridge plate, posts and lintel at one end for the door, and a few lengths of small sash-bars to take the glass in the ends. For the rafters 3 in. by 1½ in. sash-bar stuff does capitally, if they are not more than 9 or 10 ft. long, which they will not be except in a very wide house. The end rafters should be 3 in. by 2 in. stuff, with a rebate on the inside. This completes the framework, and nothing remains but the glazing and painting, and a door.

Where there is no other place available, and, indeed, in any case, the roof of the house, if flat, is a capital position for a greenhouse or conservatory. Plants like a wide and open view all round them, and perched up so high they are often out of the way of a good deal of the dirt and dust that pre-

vail down below. Plants often do much better in such a position than they would on the level ground.

Heating.—It is much better to have some kind of heating apparatus to your greenhouse if you can manage it, but this is not by any means absolutely necessary. Many plants, such as Auriculas, Carnations, Deutzias, Spiræas, the whole tribe of bulbs, Hyacinths, Lilies, &c., and even Azaleas and Camellias, can be grown without any fire-heat whatever, if a little covering be employed in severe frost; Chrysanthemums, too, are fine, and will fill such a house with bloom from the end of September to the end of January, with proper management; and you may keep in a cellar, or anywhere in the house, plenty of Geraniums, Fuchsias, &c., in a dormant state through the winter, to be brought into the house in spring, as soon as they begin to grow. But, if you do go in for heating, do not have anything to do with gas. Never mind what the makers tell you, the fumes of gas are so searching and penetrating that, however arranged, some is almost sure to find its way among the plants, and it takes a very little to spoil the health and appearance of any number. Moreover, it is very expensive, as you will soon find out if you try it. And, unless you only want just to keep the frost away, do not use any of the paraffin lamp stoves; in any case it is better to dispense with them. They are not at all expensive in the first place, certainly, and economical in use, nor are they injurious to plant life to any perceptible extent, except when much used; but combustion of any kind should be avoided in the greenhouse, and as these nearly always emit a very unpleasant odour, and we want to keep the interior of the house as pure and sweet as possible, do not use them if you can get anything better. If only a very gentle heat is needed, nothing is better than a simple brick or tile flue, running along one side or end of the house, or round two or three sides, or down the middle, or in any convenient place. But, especially in the case of a lean-to, the heat, whether pipes or flues, should be applied as far as possible on the outside so as to keep the cold out, and not against the back wall, where there is little chance of frost entering. Flues may be built of brick, with flat tiles on the top, and to be more effectual they should be built upon, and not in or below, the ground or floor, and be free all round, so as to present a greater heating surface. Remember, too, that if you want a good draught to your fire, the horizontal length of the flue must not exceed the height of your chimney—in fact, it should be rather less to draw well. The flue should have a

gradual and uninterrupted, though it need only be a slight upward inclination from first to last, and be sure you have plenty of soot-doors, or leave a loose brick (to be put in with a little mortar or clay) at all the angles, so that you can easily and frequently sweep the flues and keep them clean. The best form for a fireplace or furnace is that of a deep square or oblong pit, lined with fire-bricks, the grate at the bottom, and the door or feeding-hole at the top. Eight inches square, or 6 in. by 8 in. or 9 in., and 15 in. to 2 ft. deep from the firebars to the top, is a good size for a small house. If there is a nearly air-tight door to the ashpit, with a proper draught regulator, and the fire is carefully attended to and made up at night, it will keep in such a furnace as this for six, eight, or even ten hours at a stretch without attention. It is much better to have the damper or regulator below the fire than at any other point. But it is out of the province of this book to pursue this subject any further. But by far the best method of heating, be it greenhouse, frame, or pit, is by means of hot-water pipes, and as a very good apparatus—stove, boiler, pipes, and all fittings suitable for a moderate-sized house—can now be purchased complete for about £5, we strongly prefer the use of such to any other arrangement. The stove or furnace should be placed outside the house, and only the pipes carried inside; or, if economy and effectiveness is to be studied, a better plan is to construct a flue, running along inside the house as well, from the fireplace to the chimney; and if the flow-pipe from the boiler, instead of going straight into the pipes, is carried along, using a tube 1 in. or $1\frac{1}{2}$ in. in diameter, inside this flue, and then into the heating pipes at the other end, a still further gain will result. In this case the flue should be made proportionately larger, and should be frequently swept, and the pipe kept clean. For a house not more than 10 ft. wide a couple of 4-in. pipes carried along under the front stage if a lean-to, or a single 4-in. or 5-in. pipe carried right round if a span-roof house, will, if properly worked, keep up a temperature of 40° or 45° in the house during most cold nights in an English winter.

Ventilation should be provided for by means of sliding or lifting lights at the top, and, if the sides are glazed, some of the sashes should be hung on hinges, and it is a very good plan to have a small opening here and there, with a sliding door, in the wall beneath the front stage or shelf, opening on to the hot-water pipes, so that you may admit a little air below, which will be thus warmed before it reaches the plants in cold weather.

Kinds of Plants to Grow.—Supposing a greenhouse or glass structure of some kind has been constructed, let us consider what classes of plants are most suited for different positions, &c. In a house facing south, or nearly so, or if a span roof, if exposed to a good portion of the day's sunshine, the ordinary run of flowering greenhouse plants had better be employed—Geraniums, Pelargoniums, Fuchsias, &c., and unless a proper set of blinds for shading are provided, we would advise having a Vine trained over the roof, or some other suitable climber. The Vine will be leafless during the winter, when the plants need all the light they can get, and under cool treatment will not break into leaf before the end of March or April, by which time many bedding plants may be removed into cold frames for hardening off, and the things that are left—Fuchsias, Begonias, Ferns, &c.—will be grateful for the shade afforded by the Vine leaves during the summer; but it must be borne in mind that these must be pretty well thinned out, or the shoots kept a good distance apart, so as to prevent there being anything like gloom in the house, as is sometimes seen, and is very injurious to anything growing beneath, except perhaps Ferns, and even these are better to have a fair amount of light.

Much the same class of plants would do in a house facing east or west, but you will find that you will want a good deal more fire-heat in winter and spring, and get less bloom then than if the house looked more south; though in summer many things, such as Geraniums, Fuchsias, &c., in pots will do better in a shady house than a very sunny one, as they are apt to get so very hot, and the flower-buds being forced on too rapidly open before they have attained perfection, and fall or drop to pieces almost as soon as open; and, besides this, there is a good deal of scorching of flowers and leaves unless shading is very carefully attended to. We should, however, prefer to grow a good proportion of Ferns, Begonias, &c., in such a shady house. Calceolarias (*herbaceous*) and Cinerarias, too, like a shady place when in flower, but remember that the freedom and fineness of the bloom of nearly all kinds of plants depends greatly upon the amount of sunshine previously absorbed by them, which has hardened and solidified the tissues, and laid the foundation of plentiful flower-buds to be developed by-and-by.

Hothouse or Stove Plants.—Although we have not had *nearly* such a wide experience in the growth of hothouse, or *more commonly* called stove, plants in town, as of greenhouse and harder subjects, yet all our trials point to the

conclusion that, as a rule, all those rapid and vigorous growing tropical plants, flowering or otherwise, that require plenty of heat and moisture and but little air or ventilation, will, with proper treatment, succeed better than most greenhouse plants, which generally need such a free supply of fresh air to keep them in health. The limitation of air is indeed, where this is so impure, an obvious advantage, and if plants that need but little of it are supplied with plenty of the other elements in which they delight—viz., heat, light, and moisture, it is only reasonable to conclude that they will do well, and our experience confirms this theory. In fact, we have had, with very little trouble and only ordinary attention, such things as Begonias, Gloxinias, Achimenes, and some exotic Ferns, not to mention Cannas and other more grossly growing tropical subjects, as fine as anyone would wish to see, in the very heart of London and nearly, if not quite, equal to what could be produced in the country, and this in an atmosphere that was almost certain death to Roses, Heaths, and other greenhouse plants. As a commencement we would recommend such strong-growing subjects as Begonias (foliage), Caladiums, Dracænas, Gloxinias, Achimenes, Hedychiums, Justicias, Marantas, Musas, Palms, Hibiscus, Tydaæas, &c., to be tried at first, though there is no reason why Allamandas, Clerodendrons, Stephanotis, and others should not be done well, with care, in most places.

Therefore a hothouse or stove either in addition to, or even in place of what would be more properly termed a greenhouse, would, with a suitable choice of subjects, give as good and most probably a better return for the care and trouble bestowed upon it than a greenhouse proper. But it is, as a rule, useless to attempt anything in the way of forcing plants, properly so called, in town; not that the actual process itself might not be performed, at least to some extent, though in winter there is scarcely enough clear and wholesome light to allow of any great amount of heat being applied, for it is a well-known gardening maxim that heat must be proportioned to light, or the growth induced will be weak and worse than useless; but the chief reason is that town-grown plants are not strong enough in themselves to stand the ordeal of forcing; the result in most cases would be plenty of growth and no bloom, or very little, and we have often had the plants die after the process. The only way would be to obtain fresh country-grown plants and subject them at once to only a very gentle and judicious course of warm treatment, so as to obtain a show of blossom ^a.

month or two before the time it would otherwise appear. This might be done satisfactorily with great care, and all bulbs, &c., potted in the autumn, might, when the pots were filled with roots, be gently forced advantageously, so as to make an early display; as much air as possible should be given them, the plants must be close to the glass, and have the benefit of every ray of light and sunshine that can be afforded them.

Where expense is no object, and a refreshing oasis upon which the eye could rest at all times with pleasure is desired, we would recommend a good-sized and rather lofty conservatory to be constructed, opening, if possible, from the house, with ample heating apparatus and plenty of permanent beds or borders. This could be filled with vigorous growing stove subjects, such as those mentioned above, plenty of Palms, Musas, and such ferns as Blechnum corcovadense, Cyatheas, Lomariagibba, &c.; abundance of heat and moisture should be given, and with ordinary care a much better result would be obtained than by the use of ordinary greenhouse plants, especially in such situations as shady or partially shady courts, &c.; as many as possible of the plants should be planted out in beds.

GENERAL MANAGEMENT OF THE GREENHOUSE.

Though the same rules as apply to the management of country greenhouses also obtain here, yet there are several important differences, or at least modifications, to be observed.

Giving Air.—In the pure country air it is the rule to give air as often and as freely as possible, whenever the weather and the air outside is warm and genial enough to do so beneficially; but in towns, especially in certain conditions of the atmosphere, if you keep your ventilators open as freely as would be advisable in pure air, you will speedily find your plants covered with dust and soot or "blacks," for the more air you admit the greater is the quantity of these objectionable concomitants that gain entrance as well. On the other hand, if the internal air is not changed often enough, or is *not kept* in a state of healthy motion, not only will the plants become drawn and weak, but more or less actually unhealthy *as well*, from the stagnant air around them; so that it

becomes rather a delicate matter to hit the happy medium between the two evils. A good deal depends upon the state of the atmosphere. On dull, foggy days when the smoke hangs heavily overhead like a pall, and the soot falls in a gentle and continuous shower, give as little air as possible, or none at all. We also notice that, say in the south of London, if the wind is in the north the air is far worse, from passing over so many miles of houses and absorbing the smoke from so vast a number of chimneys, than it would be were the wind in the opposite direction, and coming comparatively fresh from the open country. Ventilate accordingly. In other suburbs the same rule applies, though of course varied by the situation. Also, give air more freely on Saturday evenings, Sundays, and on holidays, when there is less work, and consequently less smoke, &c., going on than in the middle of a busy week. It is far better, too, to give air at night and in the early morning, whenever the weather is warm enough to admit of this being done, than during the day and in the evening. All these points may seem trivial, but each one is a help to success, and "mony a mickle," &c., is a proverb we all know the truth of. Where possible we should prefer having all top ventilators of greenhouses arranged under a super-roof, so that soots could not fall directly inside, as they can if a simple opening is made, as by a sliding light. Some form of filtering the air, too, might be resorted to, at least roughly. Everyone knows that all the air that enters the Houses of Parliament is filtered through cotton-wool. It would hardly be worth while to employ such a delicate and expensive apparatus as this, but something, simple and yet effectual, might be arranged.

Temperature.—Regarding temperature, where the plants are desired to be kept slowly growing, and a few flowers produced during winter, a temperature ranging from 45° at night, or perhaps a few degrees lower in very severe weather, to 50° by day, rising to 55° or even 60° on a bright sunny day, will be suitable. In such a house the ventilators, or at least one or two of them, at the top only, should be opened a little, say 2 in. or 3 in., as soon as the heat approaches 50°, and if the sun shines and still raises it to 55° or more, and the outside air is not very frosty or piercing east wind, open all the ventilators, and, if considered judicious, give them an inch or two more. This will generally be sufficient during winter, and the openings must be closed in the afternoon, earlier or later, according to the prevailing weather. On days of severe frost or intense fog give no air whatever, and

keep only just enough fire-heat to maintain the necessary minimum temperature. Of course a difference must be made between a biting east wind and a soft westerly or southerly one, especially in spring, and as little of the former and as much of the latter as possible be admitted. When, as often happens in winter, the wind goes round to the south or west, and the thermometer stands at 45° or 50° outside, even at night, then is the time to change the inside air thoroughly, and give our pets a good fresh breath. In such a case leave the top ventilators open all night, and if the temperature is rather too much lowered by this, rather use a little gentle heat than shut up close and lose the benefit of the genial air. As the season advances and the weather gets warmer, more and more air must be given, using your discretion as to time and quantity, and even the side lights or ventilators may be opened a little as the heat reaches 60° with sun heat and a mild air outside. From May to September it is the rule to leave air on night and day, except when very stormy, but only a little should be given on bad days, and as much as possible on clear fine nights. In very hot weather, with a fierce sun, it is better to keep the house damp, pretty close, and shaded, to keep the heat down in the daytime, as evaporation goes on so rapidly and is so exhausting at such times, and ventilate principally at night. But beware of cats, when the ventilators are left open all night; they are very fond of poking into strange places, and you may find sad havoc in the morning.

In a house where plants that require more heat and moisture are grown, such as exotic Ferns, Begonias, Gloxinias, &c.; there is little need at any time for anything but top ventilation; indeed, if specially built, no side ventilators need be provided. The temperature of such a place, which would in reality be a cool stove or intermediate house, may be anything from 50° to 60° by night in winter, with a rise of 5° or 10° in the daytime, varying slightly according to the class of plants grown, to 70° or 80° or 85° by day in summer; in this case give a little air whenever the temperature rises to 65°, and more as it nears 75° or so. In such a house little or no fire-heat is needed during the summer months.

In a greenhouse proper, where bedding plants, &c., are only to be just kept alive and in health, and where Cinerarias, Calceolarias, &c., are grown for spring blooming, 35° or 40° *at night* will be suitable in winter, rising to 50° by day, or a little more on bright days, and air may be given, if mild, whenever the temperature exceeds 40°.

Watering.—The instructions previously given on this subject hold good here. On the whole, more water will be required, and may be given, than in a country greenhouse, especially in the way of overhead waterings, or the use of the syringe, which can be scarcely overdone in dry and hot weather, but do not go so far as to induce mildew; this is apt to occur in houses where the plants are watered late and shut up close at night, but if air is left on there will be but little danger. In winter water and sprinkle overhead about mid-day, between 11 and 12 o'clock, but the latter should only be done in bright weather or when much fire-heat is used. In spring and autumn water early in the morning before the sun gets on the foliage, or it will scorch or scald if wet. If the house is shut up at night see that the leaves, &c., are pretty dry when it is done; but in summer all watering is best done in the evening, giving a good soaking after a hot day in July or August, and a shower again early in the morning if the day promises to be hot and bright. But spare all expanded flowers as much as you can; they get so spoiled with the wet. Always use water a few degrees higher than the average temperature of the house. Some considerable experience is requisite to maintain just sufficient moisture in the atmosphere of a green or other house, and yet not too much—in fact, to hit the happy medium. If the air is too much charged with moisture you will have mildew and damping off, and though many plants will make a good leaf growth, yet the blooming will not be nearly so free as if the air were drier, neither at the time nor afterwards, from the tissues becoming soft and watery. On the other hand, if the air is too dry you will not only lay yourself open to visits from red spider, thrip, and aphis, very unwelcome intruders in a greenhouse, but your plants will become stunted and scraggy in appearance, with small leaves and flowers, and the foliage will speedily turn yellow and fall off. The former extreme is most likely to occur in the dull, damp days of autumn, before there is any necessity for fire-heat, which, by promoting a circulation of air, speedily checks any tendency to damp. Also in summer when growth is so rapid, and so much water has to be used, if a few dull, wet days come, be careful to keep the foliage pretty dry. So make it a rule to syringe overhead very little, or not at all, in dull weather, when there is no sun to promote evaporation. If mildew does appear, dust lightly with flowers of sulphur, remove the decayed parts, and give more air. The air chiefly gets too dry when much fire-heat is used, and especially during frosty

weather, or when east winds prevail ; but be careful how you use the syringe while the pipes are hot ; do not wet them, as the rank steam is very injurious, and sprinkle the plants themselves only occasionally. By far the best way to promote air-moisture is to keep the floor, paths, stages, &c., well damped.

Shading.—In summer, if your house is very sunny, unless there are various climbers on the roof, have calico blinds or light shading of some sort arranged so that it can be pulled up and down with but little trouble, and whenever the sun is hot bring these into use from about 11 A.M. to 3 or 4 in the afternoon, or any time so that the plants may have two or three hours of gentle sunshine in the morning, the same at night, and be protected from fierce heat in the middle of the day ; but do not allow the shading to remain for any time if the sun disappears, or longer than it is absolutely needed at any time. If you have no blinds, a piece of whiting, well dissolved in water, so as to be of about the consistency of new milk, and squirted over the roof with a syringe breaks the sun's ray nicely, but we prefer movable shading, as this can be removed and the full light admitted, and we find that the whitening has a tendency to prevent the plants flowering as freely as they would do otherwise, and besides it makes such a mess of anything it may light upon.

Cleanliness.—Above all, keep everything neat and clean, both inside and outside the house ; if time can be spared, it is a capital plan to turn the house out every week, or at least once a fortnight, to wash or wipe down the shelves, clean the glass, look over ever plant, water and stake, &c., as required, and then return all to their places, arranging them freshly and effectively. It is astonishing what a difference a periodical turn-out and cleaning makes to the appearance of a greenhouse.

Insects.—These are frequently very troublesome, and if not kept down will speedily destroy any number of plants. So that if you wish to have nice healthy plants the insects *must* be banished by some means. In a well-cared-for louse, where everything is kept clean and neat, and a healthy growing atmosphere maintained, they will seldom or never appear in any quantity ; but neglect in any shape, especially in the way of watering, is almost sure to bring about a sad state of things in a short time. Those kinds that are most commonly troublesome are the *Aphis* or Green Fly, the *Red Spider*, and the *Thrip*.

The *Aphis* or Green Fly.—This is well known, and the

most common of these pests. It is very frequently found on Cinerarias and Calceolarias, and sometimes on the fancy Geraniums and Fuchsias. This pest is caused by neglect, and by an atmosphere that is too hot and dry; it is almost sure to attack weakly plants, while healthy and vigorous ones seem to have but little attraction for it. The standard remedy is fumigation with tobacco, and where it has gained a fair footing amongst a number of plants there is nothing to be done but to shut up the house tightly some evening when there is not much wind, taking care that all the foliage of the plants is quite dry, and give a thorough fumigating by burning enough tobacco-paper in a pot to fill the house with smoke for two or three hours; but care must be taken that at no time are the fumes so thick as to prevent one seeing, dimly, of course, the other side of the house, or tender plants will suffer. If very bad give another similar smoking early next morning, and afterwards syringe everything in the house well. This will usually be quite effectual; but, as before stated, we do not recommend fumigation in the town greenhouse if it can possibly be avoided, preferring to keep all plants clean, healthy, and growing, and to pick off the first insect by hand as soon as seen, on the plan of "prevention being better than cure," as it undoubtedly is. A judicious use of the syringe is a great help in keeping this pest, as also the next-mentioned one, in check.

The **Red Spider** comes next. This is a very minute insect, so small as often to escape observation till much damage has been done, which appears in immense numbers on the underside of the leaves of many plants, chiefly in summer, and speedily destroys the foliage, causing it to turn first yellow, then brown, and finally to wither and decay. The insects, however, are not properly termed red; being so minute it is difficult to say what colour they really are, but yellow would be much more correct. These are not often found in a cool, well-ventilated greenhouse, unless great neglect in the watering has taken place; but in hot-houses or stoves, or wherever a high temperature is maintained, constant care must be taken to keep them at a distance. They are invariably produced by too hot and dry an atmosphere, and where this is the case for any length of time they are sure to appear. The preventive is to keep up, by regular syringing, evaporation, &c., a proper and reasonable humidity in the air, and where only a few have appeared they may usually be dislodged by well syringing the plants, particularly the under side of the foliage, as

forcibly as they will bear without injury. The best way of doing this with pot plants is to lay them on their sides on a lawn or other suitable place ; in this way you can get at the foliage all round without making the soil too wet. Very gentle sulphur fumes is also good remedy. This may be caused by dusting a little of the flowers of sulphur on the heating pipes when these are moderately hot, or by placing a little on a piece of slate in the sun ; but you must not go and set, say, half an ounce or an ounce of sulphur actually on fire in a house, as we have known done by ignoramuses, with the inevitable result of killing every plant in the house outright. What is wanted is the fumes so gentle as to be only just perceptible to the smell on entering the house, but this should be kept up for some days to do any good. When the Spider becomes very numerous the insects protect themselves by a minute web, and when this point is reached it will be found difficult to eradicate. Syringing with pretty strong soft soap, or size, and water (warm), allowing this to remain on for a day or two, and then a good syringing with water at 120° , is good and effectual treatment.

Thrips.—These are small white insects, very similar in appearance to the human parasite—lice. They settle on the under surface of the leaves, usually on or near the midrib, and by puncturing the arteries, speedily injure and destroy the foliage, to the great detriment of the plant. These are nearly always accompanied by what appears to be numerous small black blotches of some sticky substance, like dirty gum, on the leaves (underneath), which is doubtless produced by the insects themselves. This may be washed off by a sponge. Thrips are frequently found on Azaleas, Fuchsias, and such plants. They are produced, like the others, by dryness in the atmosphere, or at the root, or both. Fumigation and syringing the foliage forcibly are the only remedies, and are usually soon successful.

The **Scale or Coccus** is sometimes found upon Orange trees, Camellias, Bouvardias, and such hard-wooded plants, but seldom seems to trouble Geraniums, Fuchsias, &c. It is a small insect with a shell something like a very minute tortoise, clinging tightly to the stem or midrib of the leaves. When it gains any great hold of a plant it produces in addition a quantity of black fungus on the stems and leaves, particularly of Oranges. Soft soap and water, applied with a sponge, this allowed to dry on for a day or two, and then a good syringing with quite warm water will usually remove these effectually. This completes the list.

We will now consider what plants are most suitable for the town greenhouse. Those marked * are more suitable for a shady house, and those with a † are winter and early spring bloomers, and should have a moderately warm and genial temperature at that time, to induce them to flower freely. The letter c before a plant indicates that a cold house, without fire or artificial heat is sufficient; s signifies that the plant needs stove, or at least warm, treatment—that is, the greenhouse should be kept closer, warmer, and moister than would suit other things, though good strong plants of many of these will often do well in the warmest end of an ordinary greenhouse.

Greenhouse Plants that will do well with ordinary care.

Arum (Calla)	Lilies (Richardia	oLiliums
<i>æthiopica</i>)		Lobelias
c†*Auriculas		Mimulus
Begonias, flowering		Musk
†Bulbs (Hyacinths, Tulips, &c.)		Nicotiana, of sorts
Calceolarias (shrubby)		Pelargoniums (show and fancy,
cCarnations		but not tricolour Zonals)
cChrysanthemums		Petunias (single and double)
*Ferns (some robust kinds)		†Primulas (Chinese), as well as
Ficus elastica, Cooperi, Par-		cCortusoides, amœna, and
celli, and *repens		Sieboldii varieties
*Fuchsias (some kinds)		cSpiraea japonica
Geraniums (Zonals)		Vallotta purpurea

Climbers, &c.

Clematis	Solanum jasminoides and jas-
Cobæa scandens variegata	miniflorum
Passiflora corulea	sTacsonia Von Volxemi
Plumbago capensis and rosea	Tropæolum (tuberous)
cVines	

Annuals.

Amaranthus in variety	Phlox Drummondii
Balsams	Salpiglossis
sGlobe Amaranth	Schizanthus
Ipomæas	Thunbergias

Plants that will grow and flower well with care, special soil, &c., or that would be suitable for suburban districts.

†Abutilons	Cactus, of sorts
s*Achimenes	*Calceolarias, herbaceous
Aralias	†Camellias
†Azaleas (Ghent and American	Cannas
preferable to Indian)	†Cinerarias

Coleus (s in winter)	†Habrothamnus
†Correas	Hydrangea
†Cyclamen	Indigofera
c†Cytisus	Lantanas
c†Deutzias	Mesembryanthemums, and a few other succulents
Diplacus	cMyrtus (Myrtles)
sDracaenas, such as australis, congesta, Cooperi, nutans, rubra, terminalis, and Veitchii	*Orange (Citrus in variety)
Echeverias	sPalms, of sorts
†Epacris	Rhododendrons (small-growing greenhouse kinds)
Genetillyis	†Tree Carnations
†Genistas	Veronicas, in variety
s*Gloxinias	

Many plants, such as Abutilons and others, will grow and look well, but it is difficult to induce them to flower, except very sparsely. We have had fine plants of A. Duc de Malakoff, grown in London, that looked beautiful, but never showed a bud; but as soon as brought into the country, burst into full bloom almost directly. But this variety is not a free bloomer, the best in this respect are Boule de Neige and Darwinii, tessellatum; so that you must not expect to get as much bloom from these, and, indeed, most hard-wooded plants, as in the country. But a good deal may be done by careful treatment. The bloom of a good many plants depends to a great extent upon a free growth having been made some time previously, but this must be well hardened or ripened; this is accomplished by exposing the plant to plenty of sun and air and a drier atmosphere; standing or plunging in a sheltered sunny place where practicable is a very good way of doing this. If the plant does not show for bloom at the proper season, even after these precautions have been taken, partially withholding water, and giving the plant a drier, and, if possible, slightly warmer temperature, will often induce the buds to show; when they do so, give plenty of water and liquid manure, and treat liberally so as to cause the blooms to develop properly, and come large and fine.

Very few of the more delicate New Holland plants will do any good; strong plants grown in the country and brought into town will look well for a time, and with careful treatment will perhaps bloom more or less for a year or two, but sooner or later they will lose their health and appearance by degrees, and the blooms may be fewer and poorer till at last there are none at all, and after a time the poor thing gives up the ghost altogether. And yet, with care, we have been able to keep Epacris and Correas in a healthy and flowering

state for years, so that these, with a few others, may be taken as exceptions. But you cannot do anything with any kind of Heath (*Erica*): they inevitably and speedily perish. Even such hardy things as Deutzias and Genistas, that are such profuse bloomers, and so easy to cultivate in anything like fresh country air, or even in a suburb or small town, though they will grow and look well with care, yet the blooms get fewer and poorer each year, till in three or four years' time they become but barren cumberers of the ground.

The only way to get these and other hardwooded plants, such as Azaleas, &c., to do any good, is to take them in hand early, as soon as ever the flowering is over, and even this should be hastened a little, if possible, as if left to themselves, instead of flowering in March or April, as they would in the country, it is May or June before they will do so in the heart of a large town. As soon as the bloom is over, do what pruning is requisite, having previously hardened the plants a little, and remove them to a light house or pit where they can have a temperature of 60° or 70°, or 10° more for Azaleas; and here, with frequent syrings overhead, a moist atmosphere, and a liberal supply of clear and manure water at the root, force them to grow freely for a couple or three months, admitting, however, a sufficient amount of air to prevent the growth being weak or sickly. Then gradually harden off, and expose to plenty of sun and air towards the autumn, so as to get the new wood well ripened. But in such an operation as this it is of the greatest importance that the house or pit employed should be very light and open, that the plants should be kept close to the glass, and that each should be allowed plenty of room, or the growth made, if at all crowded or in an indifferent light, will be so weak as to be useless.

It is, however, better and simpler to be content with quickly growing and vigorous plants, such as Geraniums, Petunias, herbaceous Calceolarias, &c., that may be raised fresh and frequently from seeds or cuttings, that do not need any resting period, in which plants invariably get debilitated and injured, and that may be grown on quickly and flowered before they have suffered much from the unfavourable surroundings. Almost the only things that can be propagated by cuttings, and kept year after year without apparent deterioration, are the different varieties of Geraniums and Pelargoniums (always excepting the tricolor zonals, which are far more delicate than any of the other

branches of this family), and Fuchsias, and with these alone a grand display may be made.

The **Herbaceous Calceolaria** is a flower that is far too little known or cultivated, and yet it may be grown, and grown well, anywhere with a little care and the help of glass. The flowers of these are so unique, so different from anything else, and the splendour and richness of the colour and markings on some of the newer varieties especially are almost unapproached by any other flower. We do not say that anything equal to Mr. James' prize winners could be grown in St. Thomas's Street or the Borough, but we have had many a plant as fine as eye could wish to see, and that would have taken a prize at most shows, that were grown in such a neighbourhood. But these plants must have constant and unfailing attention, for they are troublesome things, at least to those who consider it a trouble to attend to them. Once checked thoroughly and they never get over it, and of all the plants we are acquainted with, we know of nothing so liable to be attacked by, and that are so speedily and irretrievably damaged by green fly as these. So that constant care, hand-picking of insects, &c., is necessary; but there is no flower that grows that not only admits of, but is greatly benefited by, being petted, to such an extent as the Calceolaria. We never fumigate plants with tobacco if it can possibly be avoided, they get far too much smoke as it is; so for all kinds of insects we depend almost entirely on syringing and hand-picking. A piece of pointed stick and a sponge and soft brush are very useful. Our rule, especially for what are called "dirty" plants, such as Cinerarias and Calceolarias, was to look over the plants every day or nearly so, and if only one insect could be seen, destroy it at once, and then it never becomes a hundred. Of course, this would not do in large places where hundreds of plants are grown, but where only a dozen or two of these sorts of things are kept it is easy enough. The foregoing remarks apply to Cinerarias in an almost equal degree; only keep them clean and keep them growing, and they must flower well. Then take

Auriculas.—What can be more delicately beautiful than these old-fashioned plants? They are not like the last, showy flowers, but they have a loveliness entirely their own and though they will probably never become general favourites, still they have made great strides in popularity the last few years; and they are certain to improve now that more attention is being paid to them. Devote as much

accommodation to these as you can ; they will do well either in cold houses or frames, and with these alone you have a constant object of interest, and a show of insuperable loveliness each spring.

Carnations, too, are an army in themselves, and to any one possessing a light airy house, and no means of heating it, we would say, fill it partially, if not entirely, with Carnations in pots.

We now proceed to give practical instructions for the successful growth and flowering of some of the most suitable and favourite plants for the town greenhouse.

Abutilons.—The culture of these is described on p. 111. In the greenhouse it is much the same. Keep the plants close to the glass, and do not let them get drawn up or leggy. Old plants, when they have got too tall and large, should be hardened by partially withholding water, and exposing to plenty of air and sun some time in summer ; then cut back pretty hard, and if they are then removed to a close warm house or pit, but little water given at the root, and an occasional sprinkle overhead, they will soon break freely ; expose a little then, and when the shoots are $1\frac{1}{2}$ in. long re-pot, shaking away most of the old soil, and replacing in a smaller pot. Keep close for a time again, and give but little water till the pot is getting full of roots, then give plenty, and a little liquid manure when pot-bound and in growth. Never give this stimulant or any other to plants at or going to rest. Cuttings of well-hardened and robust tops about 4 in. long, inserted in pots of very sandy soil, well drained, and placed in a close frame, with heat of 70° or 75° , or under a bell-glass in a warm greenhouse, will root readily in summer. When rooted, pot off singly in sandy soil into 3-in. pots, and shift on as required. If the points of the shoots are frequently pinched out while the plants are young, a fine bushy habit, which is much preferable to long straggling shoots, will result.

Achimenes.—These require warm treatment, but are otherwise very easily grown. They consist of small corms or tubers, which should be started in early spring, or any time from February to May. Put five or seven tubers in a 5-in. pot, or more in proportion in a larger one ; or it is better to start them in shallow pans in boxes, and when well started put in pots, as you can then arrange them according to strength. Use light, rich soil. Equal parts of loam, peat, leaf-mould, and sand, or rather less loam, suits them well. Start them in a hotbed, or warm, moist atmosphere of 70° to 80° , and keep the soil almost dry,

or only barely moist, until when started, as they are very apt to rot in a wet soil. Afford good drainage. Grow on in a good heat of about 70° , with bottom heat as well, if possible, removing to a house as soon as too tall for the frame. Keep near the glass, ventilate carefully, and, when required, tie each stem up carefully to a neat stake, or train on to a wire trellis in the pot; balloon-shape is best. Shade from hot sun at all times. Give liquid manure when coming into flower. After flowering water moderately, and expose to plenty of sun and heat to ripen. When the stems decay take up the corms, and store them away carefully in sand or cocoa-nut fibre refuse (dry) in a temperature of not less than 45° or 50° through the winter.

Aralias.—These are very handsome foliage plants. *A. papyrifera*, *A. quinquefolia*, *A. Sieboldii*, and *A. S. variegata* are good kinds. Pot in spring, using equal parts of loam and peat, with a little leaf-soil and plenty of sand. Give good drainage. When growing freely water liberally, and encourage growth by frequent syringings overhead. In winter keep pretty dry. Cuttings strike easily in a close heat, or seedlings may be raised.

Arum (Calla) Lily.—Full directions are given on p. 117. It is better to plant out the roots in a border of rich soil and give plenty of water than to keep in pots. In the greenhouse keep near the glass in a light, airy situation, and sprinkle over the foliage occasionally to keep it clean. Strong roots of these will stand forcing well, and can be had in flower at almost any time of year by proper management.

Azaleas.—These require almost exactly the same treatment as Camellias. Valuable hints upon their successful culture were given on p. 157. The great point is to induce them to make a free and rapid growth early in the summer, and when the buds are well formed, to expose them gradually to plenty of air and some amount of sun towards autumn, so as to harden them. It is of great importance that they should be kept cool and airy all through the winter until growing time comes round again. As soon as the flowers are over, do what pruning is necessary (this should be confined to shortening any rampant shoots, so as to keep the plants in shape), and remove to a house or pit where a rather close and moist heat of 60° or 65° minimum to 75° or 80° maximum, or 5° higher will not hurt them, can be maintained. Whatever potting is needed should be done when the plants are growing freely, say in June, but when plants have reached 5-in. or 6-in. pots, every other year is quite enough.

to re-pot, as these plants are not rapid growers, and are much better rather cramped at the root than otherwise. It is quite enough to give a top dressing of good rich soil in the alternate seasons. This should be done when the pot is dry. Scrape off as much as you can of the top soil without injuring the roots, and replace with a rich soil, such as leaf-mould, peat, well-rotten manure, and sand in equal parts, pressing it down very firmly. Water with a fine rose pot, or syringe for a few times till the soil is settled. When potting is required, turn the plants out of the pots, removing the old drainage and as much of the soil on the top of the ball as you can get, as well as all that is loose or not occupied by roots, and all dead roots, if any. Prepare a clean pot $1\frac{1}{2}$ in. or 2 in. larger than the old one, some clean crocks, a little fresh moss, and some soil, consisting of sandy, fibrous peat, picked over and torn up finely, and all the stems or roots of heather and fern removed, mixed with a little fibrous loam and plenty of silver sand, more or less according to the nature of the peat. Put a large crock over the hole of the pot, then six or eight smaller ones nicely arranged above it, and then a handful of quite small ones little larger than peas; over this a layer of moss, and then enough soil to bring the collar of the plant almost level with the rim of the pot. Set it in the centre, and fill in some soil all round, ramming it down firmly with a blunt piece of lath. Fill up in this way to within $\frac{1}{2}$ in. or $\frac{3}{4}$ in. of the rim, and finish off, leaving the collar of the plant or centre of the pot rather the highest, and use a dash of sand on the surface. In this way all hard-wooded plants should be potted, the soil made firm, no hollows or cavities left, and the surface rather highest in the centre, so that no water may lodge there. Water carefully for a time after potting, so as not to make the fresh soil sour or sodden. When the plants are making growth, syringe overhead frequently, at least in bright weather, and shut up early in the afternoon with fire-heat. Give plenty of water and liquid manure at the root, and shade from hot sun. When the flower buds appear, admit more air, and gradually harden off, but always keep under glass in town. Keep quite cool and airy during winter, only safe from frost, and when the buds begin to swell for flowering, give tepid manure water frequently; this not only produces finer flowers, but the plants will grow more vigorously afterwards.

There are so many fine kinds now in commerce, that it would be almost useless to give a selection. Any good nurseryman would supply good kinds.

Auriculas.—Full instructions for the cultivation of these under glass are given on p. 44.

Balsams.—These are perhaps the most generally admired and effective of all annuals, but they are far more so when well grown in pots than in open borders. They succeed well in towns, but you cannot grow Balsams to anything like perfection without a place suitable to their requirements. This should be a low, wide, very light, and airy span-roofed house or pit, so that the plants may have the light all round them.

The main points in the successful culture of Balsams are : 1st, abundance of light; 2nd, plenty of room—if crowded they run up tall and weakly instead of branching well; 3rd, plenty of air—they cannot endure a close atmosphere; 4th, abundance of moisture, both at the root and overhead—three or four times a day will not be too much to syringe them in bright weather, but do not do this when the sun is actually shining on the plants; 5th, plenty of food, in the shape of a light, very rich, and open compost, and when the flowering pots have filled with root, liquid manure should be given often, especially if the pots are small; 6th, a gentle bottom heat to keep them growing freely from the time the seed germinates till the blooms expand, when it should be removed; but the heat, especially in the later stages of growth, should be very gentle; none at all is better than too much; 60° or 65° above and 65° or 70° at the root will probably be about the happy medium.

Do not sow the seed too early, the first week in April is quite soon enough; these, if grown at all quickly, will bloom in June or July, and sowings may be made up to the end of July with success. Sow the seed very thinly in wide pots or boxes with plenty of drainage, in a soil consisting of about two parts of fine leaf-mould and one part each of loam and sand beneath, and only leaf-mould and sand, roughly sifted, on the top. Place in a gentle heat of not more than 65° , but the temperature of a greenhouse will do if a piece of glass is placed over the pot or box; this should be done in any case. As soon as the first pair of rough leaves—that is, the leaves that appear after the first smooth or seed leaves—are pretty well expanded, take up the plants very carefully with a smooth-pointed piece of lath, and pot singly in 3-in. pots, using the same soil as recommended for the seed sowing; in so doing bury the stalks pretty deeply, but leave the seed leaves well above ground always. At each succeeding shift the plants should be set rather deeper, so that in

the blooming pots the seed leaves should be only just above ground. This is a better plan than burying all at once, as is generally recommended.

After potting, keep the plants in a close frame with a temperature of 60° or 65° for a few days till rooted out well, then accustom to plenty of air, keeping the plants within a few inches of the glass always, and giving each plenty of room. As soon as the roots have got well to the sides of the 3-in. pots, shift into 5-in., using compost of two parts each of good fibrous loam and leaf-mould, one of rotten manure, and pretty well of sand, with good drainage. Pot firmly.

The plants may again be shifted into 7-in. or 8-in., and even on again, if very large plants are required, but remember that these plants must never be kept waiting, so as to become at all pot-bound before the flowering pots are reached, or they are spoiled. While growing, Balsams are better plunged in a gentle heat close to the glass, and as soon as the weather becomes at all warm, air should be given abundantly both by day and night. Good plants can be grown in 5-in. pots, and as soon as ever the pots in which they are to flower are full of roots, plenty of manure water should be given until the flowers begin to expand. Remember to syringe the plants frequently in all stages of growth, and give them as much sun as they can bear. Balsams may be grown and flowered in windows (inside) with great success during summer.

Begonias.—The culture of these is very simple. All of the kinds do with very similar treatment, but the present remarks are to be applied more especially to the summer flowering deciduous kinds, which are the most suitable for town culture. The foliaged varieties are extremely handsome, but most of them require more heat to do really well than that of an ordinary greenhouse, and even with this we have never been able to do them well in very smoky places, though in the suburbs they will succeed better.

The soil most suitable to nearly all Begonias is about equal parts of loam and leaf-mould, or less of the former for young plants, with plenty of sand and good drainage. Some use peat, and it does not greatly matter, but we find leaf-mould preferable. All deciduous kinds should in winter be stowed away in the pots in which they grew without being disturbed, and be kept pretty dry in a warm greenhouse, or anywhere where the temperature does not fall much below 45° or 50° for any length of time; a kitchen cupboard is a good place for these, Gloxinias, and other similar subjects.

In spring do not disturb them until they show signs of growth; then shake out and re-pot in small pots, keep near the glass, and close for a short time till growing freely. Then give plenty of water, and shade from fierce sun only. The fine-foliaged kinds, of which Rex is the type, are the better for being kept growing during winter, and to do this I should have a temperature of 60°, or at least 55°, to 70° at that season, and 70° to 80° in summer, with shade from anything like hot or bright sunshine. Shift them on as they grow; but 5-in. or 6-in. pots are enough for ordinary sized plants. The new flowering, tuberous kinds should not be watered quite so freely as the others, as if over-watered they are apt to drop their flowers. All delight in a moist atmosphere. Seed of the tuberous kinds is now largely sold and grown, and if of a good strain, produces fine plants. We should hardly recommend a batch of seedlings being raised in a large town—certainly not if the air is very bad—but for the benefit of those inclined to try, we give directions for so doing.

Take one or more 5-in. pots, the edges of which should have been ground quite flat and level, and fill them half full of broken crocks; put a layer of moss or spent hops on this, and fill up to within an inch of the top with the compost mentioned above, only roughly shifted, or only the lumps picked out, and pressed down firmly. Stand in water three parts up the pots to soak thoroughly while you sift some leaf-mould with a very little loam, quite fine, and mix it with an equal quantity of silver sand. Then take the pots out of the water and stand them to drain while you get the seed and labels ready, and a piece or two of glass to cover the pots. When they have drained a little, put $\frac{1}{2}$ in., or enough to bring the surface up to $\frac{1}{2}$ in. or $\frac{3}{4}$ in. of the rim, of the sifted soil and sand, well mixed, press gently, and the moisture from below will very likely soon appear on the surface; if it does not, sprinkle very gently and slightly with warm water. Then sow the seed, very evenly and carefully. If sown in January or February the plants will bloom the same season, if grown on quickly, but seed may be sown any time in summer, or up to July, to form bulbs for next year.

The pots of seed when sown should be covered each with a square of glass, and placed in a house or frame with a steady heat of 65° or 70°. This must be maintained, and if the soil gets dry, do not water the surface, but stand the pots in warm water up to within 1 in. of the level of the soil till the surface gets moist. When the seed is well up, tilt or remove

the glass and give a very little air. When large enough, prick the strongest plants off $1\frac{1}{2}$ in. apart in boxes in the same soil, and keep growing in a gentle heat. Do not discard the old pots, as seedlings will continue to appear for some time, so keep in warmth; the later and smaller seedlings often produce the best plants.

Pot off into small 3-in. pots from the boxes when large enough, grow on in a genial warmth, and shift as required. Established plants need no artificial heat in summer, but will do well in an ordinary greenhouse when started. Begonias may be also propagated by means of cuttings put in heat, and the fine-foliaged kinds by taking off a strong leaf and pegging it down to the surface of a light sandy soil in a wide pot or pan, and placing in a close heat; these will rapidly root and form young tubers, which should be potted off and grown and shifted on as required. If a large strong leaf is used, make 3 or 4 cuts in the midrib of the leaf at the back, plant as above, and a bulb will form at each cut.

Bouvardias.—These have very pretty flowers, some of them are very sweet, and all are good for cutting; but they will not do much good, unless very carefully tended, in anything like a smoky locality, as unless kept quite clean, healthy, and growing, they soon go wrong. We do not like very old plants; young ones are much more satisfactory. For winter flowering, for which these are very useful, cuttings should be struck early in spring, and for summer flowering they should be started the summer or autumn previous. Old plants that have been cut back give the best cuttings, when the shoots are about 3 in. long, and getting a little firm at the base take them off with a heel, and insert them in 3-in. pots half filled with drainage, then about an inch of very sandy peat, and filled to the brim with pure silver sand. Soak the pots well, and when drained put the cuttings in, 6 to 10 or so in each pot. Give a sprinkle overhead with tepid water to settle them, and stand till the foliage is dry. Then put them under a bell glass fitting just inside the rim, and plunge in a sweet hotbed of 70° to 75° . Take the glasses off for an hour morning and evening, to dry the leaves. When struck, pot off singly in small 60's, using sandy peat and a little loam. Grow on for a time in warmth, and when well rooted harden off. When these are quite full of roots, shift into 4 or 5-in. pots, using 2 parts loam, 1 peat, 1 leaf-soil, and 1 of coarse sand. Pot firmly, keep in a warm house for a time, and when in growth plunge out of doors in an airy place where they may remain till October. A second shift into 6 or 7-in.

pots may be given if needed. In winter they will need a temperature of 55° to 60° to flower well. We prefer plunging outside in pots to planting out, as some recommend, as the plants are often severely injured in lifting. Keep carefully watered at all times, and also clean from green or black fly and scale. They will flower in summer either planted out in good soil out of doors, or in pots in the greenhouse or window. A few of the best are : *Jasminiflora*, white flowers, sweet, and very free; *Vreelandii*, white, but scentless; *Candidissima*, white, very neat and dwarf; *Humboldtii corymbiflora*, immense white flowers, tubes 3 or 4 in. long, and richly fragrant; Bridal Wreath, white and sweet; *Flavescens*, creamy white, delicious scent; *Elegans* and *Angustifolia*, both scarlet, but the former has much the finest blooms; and the Bride, blush or pink.

Bulbs (*Hyacinths*, *Tulips*, *Narcissi*, &c.).—Full directions for potting these, &c., will be found on p. 114. Proceed exactly as described there, and when the pots are full of roots and the growth fairly commenced, remove to a greenhouse to flower. They will stand a moderate amount of forcing, but do not put into strong heat all at once, but increase it gradually, and when the flowers are nearly open remove it, or take the plants to a cooler house, where the blooms will come finer and last much longer.

Cactus.—These will not do much good in very bad places, but in most of the suburbs of London will succeed well with care. These and almost all of the succulent family should be potted in spring, using plenty of drainage and a compost of loam, peat, leaf soil, old mortar rubbish or crushed sand-stone, and sand in equal parts, with a little charcoal. Pot firmly, keep dry when at rest, and cool as well. When growing, afford as warm and moist an atmosphere as you can, and give abundance of water. These require light, airy positions, and are rather best grown in a house by themselves. Do not shade at all, and if the plants do not flower as they should do, give them a dose or two of hot water, nearly boiling; it will do no harm, and make them flower. Cacti are given to emit branch roots, and if you can train a plant or two up against a trellis 3 in. or 4 in. from a back wall, and the space packed well with nice clean moss, and this be kept always moist, the plants will root into it all up, and give you a finer plant and more and better flowers than can be had in any other way. There are many species of *Cactus*—viz., *Cereus*, *Echinocactus*, *Melocactus*, and *Opuntia*; and the *Epiphyllums* may be included. All need the same treatment,

with but slight variations, as do also most succulents, as Aloes, Crassulas, Mesembryanthemums, Echeverias, &c. All are easily propagated by cutting or offsets inserted in very sandy soil in a moist heat in summer.

Calceolarias.—There are two classes of these beautiful plants, both of which are suitable for greenhouse cultivation —viz., the herbaceous and the shrubby. The former are by far the most attractive, as their blossoms are very large, and of very rich and infinitely varied colours; and though they are more difficult to cultivate, yet are more worthy a place in the conservatory, and claim the first place in our consideration. They certainly require a great deal of care and attention, but they will amply repay any amount that may be bestowed upon them. We know of no plant that may be made to succeed better in town air than this. The great points to be attended in the culture of Calceolarias are—never to let them experience a check in any way; to keep them well supplied with water; to keep them always as cool as possible, and yet safe from even slight frost; and, above all, to maintain them in a clean, healthy, and constantly growing state, and perfectly free from insects.

If once these plants get thoroughly dry, the aphis or greenfly is almost sure to attack them, and then they are soon spoiled. They love shade from hot sun, and luxuriate in a moist atmosphere, free from drought, and yet with a constant supply of fresh air. Calceolarias are far better raised freshly from seed every year; it is almost impossible to keep old plants through the winter in town, and though strong plants often yield cuttings, which strike easily in a close moist frame in September, yet these are never so robust as seedlings. Here, as with Cinerarias, a good deal depends upon having the plants strong enough, and yet not too far advanced, by the approach of winter.

We have found that plants of these in pots, especially if kept in a house where much fire heat is used, to which they have a great dislike, are apt to dry up and shrivel, or go off in some way; and that by far the best mode of keeping them is to have good robust plants, 2 in. or 3 in. across, well established in large flat boxes by November. If you must have large plants, and they have been potted in autumn, it is better to have them very early, and in good large pots (6-in. or 7-in.), and to plunge them in moss or hops on a wide shelf in a cool greenhouse where only just enough heat is used to exclude frost. They may be kept also in a cold frame or pit, if the sides are well protected by banks of turf soda,

and the glass well covered up in frosty weather by plenty of thick mats, &c., and attention paid to watering and ventilation; for Calceolarias are much hardier than most people believe, and the less fire heat they have the better. If the plants are to be potted off before winter, the seed should be sown in May or early in June, but if to be kept in boxes and flowered in 6-in. or 7-in. pots in May or June, June or July of the previous year will be soon enough.

Prepare a pan or box—3 in. or $3\frac{1}{2}$ in. deep, and 7 in. or 8 in. by 12 in. to 16 in. or 18 in. long, is a good useful size—by placing $\frac{3}{4}$ in. of small crocks in the bottom (remember to have plenty of holes for drainage); over the crocks put a thin layer of moss or spent hops, and then put 1 in. or more of the following compost, not sifted, only well mixed and the lumps picked out—viz., equal parts of loam, leaf-mould, nice fibrous peat, and silver sand. Press this down firmly, give a good watering through a syringe or fine-rosed pot; and stand aside to drain a little. Then spread a layer of about $\frac{1}{4}$ in. of the above compost, sifted very finely, and adding another part of sand evenly over the surface; do not water this, but press very gently till the surface is quite flat and even (we use the back of an iron spoon which we employ for such fine work in preference to a trowel). Then scatter the seed evenly and not too thickly over the soil, give a nice dusting of dry sand or very fine soil, or none at all, and place the box in a cool frame or hand-light under a north wall, or in any cool and quite shady place, putting a good layer of coal ashes, well watered, for the box to stand upon. Place a sheet of glass over the box, and shut up the frame or light quite close. Unless the surface of the soil gets dry, which it should not in such a position, do not water till the seedlings are up. If the frame is moist and shady, and the weather cool, do not use the sheet of glass, as it is apt to cause the surface to become mossy, which destroys the young seedlings, the glass is only needed to counteract too great evaporation.

When they appear, place the box close to the glass, so as to get all the light possible, but no sun; and when a little advanced, tilt the glass a little, and give a small quantity of air. If the soil gets dry give it a good soaking, very gently, though, so as not to wash out the young plants, and if it is too damp and some decay, stir them about a little and break up the surface with a pointed stick, dust with quite dry silver sand, and give more air. The leaves and stems of the young plants must be dried sometimes or decay will set in,

but keep all as moist, though not wet, as possible. When they can be handled, prick off about $1\frac{1}{2}$ in. apart in boxes in the same soil as recommended for the seed sowing, but not sifted. Keep close for a while and still shaded, and when established admit a little air. As they strengthen give more air, but not too much, and let the sun touch them for an hour or two morning and evening, so as to harden them and enable them to stand the winter. While the plants are young, keep a good look-out for slugs, which are very destructive.

Before they get crowded here take out every other one and transplant into other boxes, so as to have all 3 in. or 4 in. apart. In this state they may be wintered well. Keep cool, light, and moist, and airy through the winter, and when they are getting to touch one another again, say in February, take as many pots as you want from 5 in. to 8 in. or 9 in. in diameter, crock them carefully (three or four good-sized crocks are enough), put in a handful of hops, and fill up with good rich fibrous loam four parts, and well-decayed manure one part, with a little sand only if the loam is very stiff. Use this compost in a rather rough state, not broken up too small, and if it has been exposed out of doors and got well frosted previously, all the better, but it must not, of course, be in anything like a frozen state when used. Do not press it in too firmly, leave a hole in the centre of each pot, take up each plant carefully with as much earth round the roots as you can get and set in its place, filling in a little soil all round so as to partially bury the stem.

If the plants are not to be shifted again, pot them rather deep, and leave a little room at the top for the addition of a little more soil at some future time, as these plants keep putting out roots at the base of the stem, and are benefited by a little earthing up; but if they are to be shifted it does not matter, yet always pot rather deep. You may either pot into 5-in. now and shift on afterwards to any size, or put straight into the blooming pots. When potted give each a thorough watering through a fine-rosed pot, and set on a shelf near the glass. They will now grow rapidly, and if they are to be shifted again it must be done as soon as ever the roots touch the sides of the pots.

Plenty of water must be given when required, and the flower-stalks supported by neat stakes when needed. When the flower-buds appear, liquid manure, moderately strong, should be given at each alternate watering. Shade from hot sun as the days lengthen. Never let an insect, once seen,

stay a moment on a plant, nor a dead leaf either. In May or June and July, your plants will be the admiration of all, but be careful to shade from sun when in flower, as it causes the blooms to scorch up very quickly.

It is of little use to try to keep the old plants over till next year, though if you have an extra fine one you may propagate it by cuttings, that is, if you can get any. The best way to do so is to plunge the pots in moist, cool fibre or ashes in a frame in a shady place, and keep well watered, or turn out of the pots into a shady border of light rich soil. Remember that it is often the weaker and later plants that produce the finest flowers, so do not throw away a delicate looking one; they often take a start quite late, and burst into splendid bloom. But if once a plant gets covered with greenfly, it is of no use to bother with it any more.

The shrubby Calceolarias make fine pot plants; for propagation, &c., see p. 47. There are several fine old kinds with beautifully coloured blossoms, besides the common yellow and brown bedders, but unfortunately they are almost forgotten now-a-days, at least one seldom meets with them. Treat them much the same as the herbaceous kinds, but give a richer soil, and pot more firmly; also afford more sun and air. These are easily propagated by cuttings in September and October.

Camellias.—No need for comment upon these. Both foliage and flowers are so fine as to be unapproached. Directions and remarks are given upon p. 118. They need a cool, airy, and somewhat moist greenhouse for their winter quarters; and in spring, when the flowers are over, should have a close, moist heat in which to make growth. Give a shady position in summer, and keep always under glass. Water liberally when in growth and flower, and more carefully, yet keeping moist, during winter. But little pruning is needed for these, and it should usually be confined to shortening back any straggling shoot. If plants must be cut back closely, they should be well hardened previously, and then placed in a stove or forcing-house to break again. This should always be done directly the flowers are over.

Campanulas.—Full directions for the culture of these elegant plants will be found upon p. 119.

Cannas.—See p. 119. The culture in greenhouses is almost identical with that in windows. We always think that early *sown seedlings* make the best plants, and if you have any *heat by all means raise a few*. The seeds will germinate in *pots or pans of light, rich, and rather rough soil in a hothe*

of 75° or 80°, though a few degrees higher will not hurt them, but do good. The contrivance described on p. 200 will suit these nicely. The seed must be soaked in hot water at 120° or 130° for twelve hours before sowing. When up and 3 in. or 4 in. high, pot the plants off into 3-in. pots, and keep growing on in heat. Shift on as required. In May the plants may be removed to the greenhouse, and if liberally supplied with pure and manure water, syringed occasionally, the leaves sponged and kept clean, and plenty of sun and light afforded them, they will grow rapidly and make very handsome plants.

Well hardened plants may be turned out of doors into a bed of deep, rich soil, and if in a warm and sheltered situation, and plenty of water be given, they will grow well in a warm season. Some have very fine purple or striped leaves; such as *Bihorelli*, *nigricans*, *purpurea*, *hybrida*, and *zebrina superba*. Others have the leaves of different shades of green, and all have curious but not unhandsome flowers of various shades of red and yellow.

Carnations.—For full directions see p. 50. The tree or perpetual kinds are more generally treated as greenhouse plants, but for towns we recommend the ordinary Carnations. The tree varieties do not produce layers, so are propagated by means of cuttings of the side shoots from the stem. These are taken off early in spring, for though they will strike at any time during the summer, yet if not started early they will not bloom the first year. Strike the cuttings exactly as described for the others in pots or a bed of very sandy loam, made very wet, and a steady but gentle bottom-heat applied. They will strike well in a close frame or under a bell-glass or handlight in summer. When rooted, pot off singly into 3-in. pots, using sandy loam and a little well-rotted manure; pot firmly, and shift on as required.

If plants are wanted to flower in the winter, only tree varieties must be employed; they must not be allowed to do so in the summer, but plunged in a sunny place out-of-doors, and removed to a warm, airy, and rather dry greenhouse. Do not over-water at any time. It is difficult to get these to flower much in the winter in bad localities; they want the fresh air and free light of the country to do so; still, it may be done in the suburbs with care.

Chrysanthemums.—See page 52.

Cinerarias.—These are universal favourites, and deservedly so. They can be had in flower all the year round in the country, but in town you can only depend upon

them in the spring and early summer; they will not open their blooms in the fogs and smoke of winter, however carefully grown. Nevertheless, you may have a fine show in spring, and at least a few should be grown wherever there is a greenhouse. The easiest and simplest way of propagating these is by sowing seed, yet if you have a good vigorous kind with fine flowers, propagate it by means of suckers. You must exercise a little discretion in finding out the best time to sow the seed, as your plants must be strong enough to stand the winter when it comes. And yet if you get them too forward, they will, from not being able in the unfavourable conditions of the winter season to form that rapid and healthy growth that should take place before flowering, not only receive a severe check, but from arriving at a flowering state before the weather is open enough to enable them to do so freely, suffer in the bloom as well.

These considerations are of no consequence in country air, where Cinerarias will bloom at any time in a temperature of 45° or 50°, but in town they are of the greatest importance. We have always succeeded best in having nice, sturdy plants established in 3-in. pots by November, to obtain which it is advisable to sow the seed at the end of July or early in August.

A celebrated nurseryman says that the secret of growing Cinerarias successfully is to grow them fast, which is quite true, at least in the later stages of growth, as the flowering is never so fine as when the plants have shot up their flower-stems quickly, and never had a check of any kind till the flowers open. But the plants must have a good strong foundation upon which to bloom, or the flowering will be scanty, weak, and poor. To obtain this the young plants, either seedlings or suckers, should not be delicately reared or pushed on at all quickly, but be hardened with plenty of sun and air, and, in short, be raised as roughly as possible.

One very good Cineraria grower exposes his plants when potted off, with two or three leaves each, into 3-in. pots, in the open air in a sunny place, the pots being plunged in ashes. This is done, of course, in summer or autumn, earlier or later. We should not recommend this to be done in the air of a town, however, as the plants would suffer too much from the smoke and dirt. The following is about the best mode of procedure: Obtain a packet of good seed from a first-class firm or grower, and do not grudge half-a-crown for it—*this is* the usual price, though you can get inferior seed, or a very small quantity for less. Prepare a pan or box, as recommended for herbaceous Calceolarias, and sow

the seed exactly as directed there, but the surface need not be made quite so fine, though nearly so. Place the box, when sown, in a shady frame kept close, or under a hand-light under a north wall, as for Calceolarias, but give more air than for those plants, and not quite so much moisture. Give air as the seedlings progress, and when they are large enough to handle, prick off 2 in. or 3 in. apart in other boxes, using the same soil as for seed sowing, only omitting the sifted soil on the surface. Give a thorough watering from a fine-rosed pot when finished to settle the soil about the plants. Keep them close in a frame for a few days after this operation, till they have struck root freely. Then admit air gradually. Remember that Cinerarias should never want for moisture at the root, but always be kept moist, and have a moist atmosphere around them, though we always keep a little drier at the root after pricking out or any potting lest the new soil should get sodden.

The young plants should be always kept as close as possible to the glass from the time they first appear, so as to produce strong and short foliage. When they have begun to get crowded in the boxes, put off singly into 3-in. pots, using equal parts of loam and leaf-mould, and not quite a part of sand. Put a few small cinders in each pot for drainage, as Cinerarias are very partial to these. Keep close again till rooted out, then accustom to plenty of air. It will now be most likely some time in September, and the frame in which the plants are should now face full south in a sunny position, and no shading should be used unless the plants flag much; they should be plunged in ashes, hops, or some open material, so as to protect the roots. Air should be given abundantly and the lights tilted up high, or drawn off altogether for an hour or so on fine clear mornings and evenings. Here they should remain till there is danger of frost, say the end of October, and on very cold nights before this the frame should be shut up close, and a mat or two spread over the glass if there is any danger of even a slight frost. Then remove them to a cool greenhouse or pit where the frost can be well kept away, but little or no more heat than is required for this should be used. They should be placed on a shelf close to the glass. Of course they will do in a house where a temperature of 45° to 50° is maintained, but unless very carefully looked after they are far more liable to get covered with aphid and other pests in such a temperature than in a cooler place, and the warmth makes them grow too soon. In any case, they should be frequently looked

over, and any dead leaves or insects removed, but fumigation with tobacco should not be resorted to if it can be avoided : far better depend on hand-picking. It is not much trouble to pick a few insects off a plant, and if this is done regularly there will never be more. Plenty of air must be given in favourable weather. When the plants are ready for a shift, say in January, move them into 5-inch pots, using two parts good fibrous loam, one part leaf-soil, one of well-rotted manure, and some sand and crushed charcoal, using the cinders for drainage as before; plenty should be provided, as the plants will require abundance of water presently. Still keep them quite clean, with plenty of air and light. They may be shifted again when ready into 7-in. or 8-in. pots if required, but for ordinary display the smaller plants are the most useful, and take much less room.

If they are not shifted, however, weak liquid manure must be given two or three times a week when the plants get pot-bound. By April the flower-stalks will be appearing, and when once these show the plants must be grown on freely without a check. It is better to give none but top air, as these cannot bear draughts, and if the plants can be plunged in moss or hops or some such material that can be kept moist, they will do better. Shade from hot sun after April. If any of the flowers are fine enough to be preserved, cut the plants down to about 6 in. of stem, when the bloom is over, and stand them out of doors in a shady place, or turn out of the pots into a shady border of light rich soil. When the suckers have formed and got strong, in July or August, take them up, and pot separately in small pots, treating them just as you would seedlings.

Clematis.—Many of these form splendid subjects for a cool house where little or no fire heat is applied. The blooms of the finer kinds come grandly under glass. The Jackmannii varieties are of course most easily grown, but for fine flowers some of the Lanuginosa type would be preferable. They merely require planting in a bed, large box, or pot, of good loamy soil, and training on strings up the roof or elsewhere. Keep dryish when at rest ; prune rather freely in spring if needed; at least those of the Jackmannii and Lanuginosa types may be treated thus, but those of the Pateus type, which flower from the old wood, must not be cut in spring. Many of these are suitable. Water liberally when in full growth and flower.

Cobaea scandens variegata.—This is a very pretty climbing plant with variegated foliage, and far more desirable

than the plain-leaved form, as it is not so rampant in growth. Any light soil, moderately rich, will suit it, and it should be planted out in a border, or large box or pot, and trained against a back wall, or wherever desired. Keep dryish in winter, and water freely in summer; prune in rather closely in spring.

Coleuses.—These have been very much improved of late years, and the foliage of some of the newer varieties is unsurpassably lovely. These plants will not live through the winter if the temperature falls below 55°. Young struck plants, well established in pots in rather poor soil, keep well through the winter in an ordinary stove, but we should recommend young plants or rooted cuttings being purchased fresh from the country. The side shoots from the autumn-struck plants strike readily in sandy soil in a hotbed in spring. The cuttings when rooted should be potted singly in 3-in. pots, and placed in bottom heat to root out. A good compost is equal parts of loam, peat, and leaf-mould, with plenty of sand. They will do in the greenhouse after April. Water liberally when in growth, exposing to plenty of sun and light. Pinch the points out of all long shoots, to keep them bushy, and train and shift on into large pots as required.

Correas.—These are hard-wooded New Holland plants, having long tube-shaped flowers of a scarlet or scarlet and yellow colour, which are freely produced in winter. They do well in towns with care. Re-pot in April into pots 2 in. or 3 in. larger, using two parts of sandy peat, one part fibrous loam, a little leaf-mould, and a fourth part of silver sand, crocks broken up very small, and powdered charcoal, all well mixed. Pot very firmly, leaving the centre rather the highest, water carefully for a time, and keep rather close at the warmest end of the house to make growth, keeping near the glass, however, and not shading except from fierce sun. When well rooted and growing freely water liberally, and pinch out the point of any luxuriant shoot, to keep the growth even. When the growth is made, and the buds, which look like little Acorns, are appearing, admit more air, and gradually expose as much as possible, but keep under glass always. In winter give a light sunny place, with moderate warmth, water as required, and you will have plenty of flowers.

Cyclamen.—These are great favourites, and deservedly so, but they will not do much good in the heart of London or any large town, though in a suburb even pretty close in,

such as Brixton, Dalston, or Hackney, they may be grown well with care. Sow the seed in a gentle heat in early spring to flower the next, or in any shady frame or pit in summer, in which case they will not flower for two years. Sandy loam, leaf-mould, some peat, and plenty of sand suit them best. Give plenty of drainage, and cover the seed slightly with fine sandy soil, and press pretty firmly; place a square of glass over the box or pots, and never let the surface of the soil get quite dry.

The seeds are generally some weeks in germinating; but be patient, and when they have two or three leaves each, pot off singly in small 3-in. pots in the same soil, and place in a gentle heat, if possible, or if not in a close frame, till rooted out. The main thing, at least for young plants, is to keep them gently growing in a moist, warm, and genial atmosphere near the glass; and never dry off the corms or bulbs, or disturb them more than you can help. When small, the bulbs or corms should be just covered with soil, but as they get a fair size let the crowns appear above the surface. Shift on into larger pots when required, but do not perform this operation more often than is required, as these, like all bulbous plants, do not like being disturbed at the root. A 5-in. pot is quite large enough to grow a good-sized plant in, and for the first year, unless in very experienced hands, they are better in nothing beyond large 60's or 3-in. pots. To flower in early spring they need a temperature of 45° or 50°, and for winter flowering only vigorous plants should be used, and the heat of a forcing-house or stove is necessary; but if kept in a cool greenhouse, they will flower about May.

The plants must be very carefully watered at all times, and all extremes of temperature avoided. In summer the plants should be plunged in cocoanut fibre or hops in a frame, with plenty of sun and air given to ripen the bulbs well, and induce a free flowering habit. Re-pot about August, or whenever the plants show signs of fresh growth after the rest of summer. Remember in all operations that these are natives of Persia and Palestine, where they generally grow in rich sandy loam on rocky hillsides, where the sun is very powerful in summer, and that at their period of growth and flowering, in the springtime when the sun breaks through after the rainy season, both the ground and the heated air are saturated with moisture like a hothouse for a time, and this is succeeded by the dry and fierce heat of the Eastern summer.

Cytisus.—These are fine plants for a large house, but they are not suitable for small ones, as they are very free in growth; a good plant will be 6 ft. or 8 ft. or even more in height; still, as they bloom freely in a very small state, young plants are very desirable, even for small houses. A fine head of bloom may be grown in a 5-in. pot. They are very free flowering. Soil, three parts of sandy loam, one of leaf-soil or very old decayed manure, with a little sand, and good drainage. Prune freely after flowering, and when commencing to grow again re-pot into the same or larger sized pots, and encourage growth by frequent watering and syringing, and a somewhat warm and humid atmosphere. When a good growth is made, expose freely to sun and air. Water moderately, and keep cool through the winter. *C. racemosus* is a great favourite with market growers.

Deutzias.—These are extremely pretty, and not known or grown nearly as much as they should be. For cultural directions, see p. 120. In the greenhouse, afford a light and airy position near the glass. Cuttings strike freely in summer or autumn under a bell glass, or in a close frame.

Diplacus.—This, the shrubby mimulus, is pretty, and very good for cutting from, as the flowers last a long time. Re-pot in spring, using any good soil, say three parts loam, one each of leaf-soil and peat, with some coarse sand. Water freely when in growth and flower. Cut away the long shoots that have flowered, others will spring from the base. Give a light and airy position. Cuttings in spring or summer, in sandy soil, either in heat or under a bell-glass. *D. aurantiacus*, with dead gold coloured flowers is one of the best.

Dracænas.—Very handsome foliaged plants. In a warm greenhouse or stove, almost any kind will grow and do well. As a rule, the green-leaved kinds are the hardiest, and do best under cool treatment, and the red and variegated-leaved ones are more suitable for a warm house. Keep near the glass, light, and air. Encourage a free growth during spring and summer by copious waterings and syringings, and in winter keep drier, yet always moist. Re-pot, giving a healthy plant a good shift in spring. Pieces of the root or stem cut into short lengths with a joint will root readily and form plants in a sandy soil in strong heat. The large leaves of these plants can be easily kept clean by sponging, which is a great advantage. When the growth is made, they are very useful for indoor decoration, as they will stand a dry air well.

Epacrises.—It may seem strange that these will do so well in a town, where Heaths, to which they are very similar, always fail, but it is a fact, nevertheless. But Epacrases are very skittish things, too, and need care and judicious management to make them do well.

They are so extremely useful, however, from the flowers being produced in the depth of winter, and lasting a long time, and also from these being very enduring when cut, which makes them invaluable for bouquets, &c., that we strongly recommend them. Purchase one or more good plants in 5-in. pots in the autumn. Place them on a light airy shelf near the glass in a greenhouse with a temperature of 45° or 50°, or even 5° less; water only when required, yet keep the soil always moist, and if the ball gets so dry that the water runs away at the sides and does not wet it, soak the pot for half an hour in a pail of tepid water. They will come into bloom, even in the heart of London, in November or December, and the flowers will last two or three months. If any luxuriant shoot, with little or no bloom upon it, develops and grows rapidly, pinch its point out.

After flowering, keep dry and harden a little. In March cut back all the strong shoots to 2 in. or 3 in. of their base, but leave the weaker ones alone, and keep warm and close in a pit or moist house till the young shoots break. When these are 1 in. long re-pot, if needed, into pots 1½ in. or 2 in. larger, using fine sandy peat, with a little loam for old plants, plenty of sand and charcoal; use good drainage, pot firmly, and keep the collar of the plant high; in fact, proceed as described for Azaleas. Water very carefully after potting, and keep close for a time. When growing give them more water and air, and during growth keep close to the glass in a light airy house or pit, syringing overhead frequently, but never shading except from scorching sun. When the growth is made, expose to as much air and sun as possible, and do not water so freely. Any luxuriant shoot should be stopped at any time. In winter remove to the greenhouse as before.

Ferns are always elegant and useful, and in anything like a shady house should have the preference to almost any class of plants. In any house, however sunny, there is always a suitable place for a few. Almost any of the ordinary run of greenhouse Ferns will do with care in a town, but we would not advise any one to attempt any of the following kinds, unless, at least, they have a special Fer-

house, and are very skilful and experienced in the culture of Ferns : *Acrophorus*, all varieties ; *Adiantums*, the more delicate kinds, as *hispidum*, *reniforme*, &c. ; *Cheilanthes*, all varieties ; *Gleichenia*, all varieties ; *Hymenophyllum* (unless under bell-glasses) ; *Todeas*, ditto ; *Trichomanes*, ditto. Where the house is pretty well filled with flowering plants, and air and treatment to suit them is given, we would only advise the following kinds to be grown :

<i>Adiantum capillus-veneris</i>	<i>Doodia blechnoides</i>
," cuneatum	<i>Lomaria</i> , of varieties
," <i>aethiopicum</i>	<i>Nephrodium molle</i>
<i>Asplenium bulbiferum</i>	<i>Niphobolus lingua</i>
," <i>caudatum</i>	<i>Onychium japonicum</i>
<i>Blechnum cognatum</i>	<i>Polystichum flexum</i>
<i>Davallia canariensis</i>	<i>vestitum</i>
," <i>Novæ-Zelandiæ</i>	<i>Pteris</i> , all varieties

In order to grow Ferns to perfection, however, a special house should be set apart for them, if only a small one, or even a pit or large case, where a heat of 50° or 55° minimum to 60° or 65° in winter, and 70° to 80° in summer, can be afforded them, or even less would do, but nearly all Ferns revel in warmth ; where but little air, and that only at the apex of the roof, need be given, and abundance of moisture both in the air and at the root can be afforded. Deciduous kinds, however, should be kept cooler than recommended above when at rest in winter.

Ferns may be either planted out in the hollows and crevices of rockwork or grown in pots. In the latter a soil composed of equal parts of loam and peat, with abundance of sand, and a portion of crocks broken small, the whole well mixed, but used rather rough, with good drainage, will suit them, or most of them ; but some Ferns, especially strong-growing ones, will do better in nearly all light peaty loam, and other delicate ones need nothing but sandy peat.

Always pot firmly, and keep the crowns well out of the soil. - Until plants get large, strong, and vigorous, do not give them much pot room, as with a lot of wet soil at the root they are very apt to get unhealthy. Nearly all Ferns should be potted in the spring, just when beginning to grow afresh. Some need more shade than others, but all should be protected from hot sun, and as long as direct sunshine is kept from them, the clearer and fuller the light in which they grow, the more robust and healthy will be the growth. Water plentifully, and syringe most kinds overhead frequently during the growing season, but in winter keep drier.

yet always moist; the deciduous kinds must be drier than evergreens when at rest.

Ficus elastica (Indiarubber Plant).—See p. 123.—The general treatment in the greenhouse is very similar to that of Dracænas, the principle being to encourage a liberal growth by plentiful watering in a warm and humid atmosphere in spring and summer; admitting more air, and exposing moderately towards autumn, and keeping cooler and drier through the winter. Shade slightly from very hot sun while the young leaves are tender, but these plants will do equally well in sun or shade, though not in gloom. *Ficus Cooperi* and *F. Parcelli* are both desirable, and *F. repens* is a capital plant to cover a wall in a shady house.

Fuchsias.—A list of suitable kinds, with instructions for growth, is given on p. 124. The remarks to be found there apply here as well. Where a number are required, the best way is to keep one or two old plants of each sort wanted in the greenhouse through the winter, and keep them gently growing; this is better than forcing them rapidly into growth, as the shoots are then so weak. In February or March, or as soon as you can strike them (and the earlier they are started the better), take off the shoots, which should be 2 in. or 3 in. long, and put them into 3-in. pots, using leaf-mould and sand in equal parts, and putting five or six cuttings or more in each pot. The cuttings should be taken off with a heel and neatly trimmed, taking off the leaves half-way up. Place in a frame, or heated bed in a warm house, with bottom heat of about 70° or 75°, and top heat 5° or 10° less. They will soon strike root, and should then have a little air admitted, and when ready pot singly in 3-in. pots, using the same soil. Keep them growing for a time in a moist gentle heat, and when too tall for the frame, if in one, remove to the greenhouse, though they would be the better for rather more warmth and moisture than that will afford for a time. Syringe the plants overhead daily, and shut up the house early in the afternoon, so as to enclose a good amount of the heat of the sun. Train the plants as they grow, as before recommended.

Some kinds, like *Avalanche*, when grown on vigorously from a single shoot or stem, need no pinching, but produce side shoots plentifully and naturally, and grow into perfect pyramids. These only need to be tied up to a neat and strong central stake. But most kinds need more careful training, and do not be afraid to pinch out the points of all strong shoots frequently; it does good, though it retards

the time of flowering; but better wait a few weeks and have a really beautiful plant well furnished with blossoms than a straggling specimen now. When the small pots are full of roots, shift into 5-in., and the plants may either be flowered in these, or shifted again into 7-in., if there is time to do it in, but it does not do to shift much after June, and 5-in. pots will grow very fine plants. When coming into flower give a shady situation, if you can, and the flowers will be all the finer and last longer. Plenty of water must be given at the root, and manure water, not too strong, at alternate waterings after the blooming pots fill with roots.

When the flowering is over keep slightly drier, and expose gradually to plenty of sun and air; in fact, harden off and turn out-of-doors in September, as if not well hardened a severe winter may injure or kill plants grown so rapidly. Keep during winter in a cool greenhouse only just moist, or in a frost-proof cellar nearly dry, but take care they do not get so dry as to cause the wood to shrivel, or there is an end of them. In spring, when they begin to shoot out again, cut back lightly and bring into the greenhouse, giving a little water. When the shoots are 1 in. long, re-pot in as small pots as will comfortably hold them. Keep close a little, then grow on, and shift as required. The plants will flower earlier and not need to be pushed on so fast as young ones.

Fuchsias should never suffer from want of water when in growth. They should have plenty of air to be sturdy, though they will do with less of it than Geraniums, but they cannot bear draughts or chills; a sudden draught or change from one place to another even will sometimes cause a splendidly budded plant to drop them all. So it is safer—at least in town, for it is very different in the country air—when under glass to give little but top air.

Genetyllis are lovely things, but require great care, especially where the air is not pure, as once out of health it is difficult, if not impossible, to bring them round. The flowers are bell-shaped, white or yellow, and red or crimson; they are produced in spring and early summer. Pot in spring, or after flowering, using about equal parts of peat and loam, with a little leaf-soil and plenty of coarse sand. Keep the collar high, and pot firmly. Keep close for a short time, but give as much air and sun as possible at all times. Water freely when growing or flowering. *G. fimbriata*, *fuchsoides*, and *tulipifera*, are best.

Geraniums.—The culture of these has been fully described

on p. 126. The treatment is much the same in the greenhouse as in the window. We always obtain the best results from cuttings struck in a frame in August or September. It is a great point to grow only from short-jointed, well-hardened cuttings, and for this reason those taken from plants in pots, especially if these have been exposed to plenty of sun and air, and had but little water for some time previously, are far better than the soft and watery shoots from plants that have been growing in the open borders, as these always, and especially in a wet season, make such a rapid and succulent growth. However, when these must be used, they may be made very suitable for striking by choosing as many robust points as are wanted about a fortnight before the cuttings should be put in, and with a sharp knife cutting half-way through each just below a joint, about 4 in. from the point of the shoot. The cut will speedily cause a callus to form, and, by the flow of sap being materially checked, the embryo cutting will become hard and woody. In about the time mentioned separate the shoot by cutting through the remaining half, and plant in the usual way. It is well, in taking all Geranium cuttings, to leave them, before planting, till the cut part is dry, or to dip the ends in dry silver sand. We generally, for pot plants, put three or four cuttings in a large 3-in. pot, using plenty of drainage, and proceeding as directed on p. 128. When well rooted, or as soon as safe in spring, pot off separately, and shift into 5-in. or 6-in. to flower. Geraniums cannot have too much air or sun in winter and spring, or at any time when growing, but in hot weather they bloom finer and last longer in a shady place. This only applies to plants in pots.

For winter flowering, old plants that have been cut back and started and re-potted, then plunged out of doors in the full sun, should be used as described on p. 129. If you can take such plants as these into a light, airy, and sunny house, with wide panes of glass, keeping them near it and with plenty of room and air on all possible occasions, and give them a warmth of 48° to 50° by night to 55° or 60° by day, they will blossom abundantly for months, sometimes right through till spring comes again. But they must not be watered nearly so abundantly as in summer, yet kept moist, and a little manure water given occasionally. The air must be moderately dry, or they will grow too much and not flower, so that a forcing or hothouse will not do, from the atmosphere being too close and moist. But even in a greenhouse with a temperature of 45° to 50°, if the plants have a

suitable light and airy position, they will bloom late in autumn, and even up to Christmas if prepared as described. By March, if you want to keep up the display, have another lot of (old) plants ready to come into flower, and when these are past the best, the last autumn-struck cuttings will be ready to take their places.

Globe Amarantus (*Gomphrena*).—Very pretty and useful warm greenhouse or tender annuals, with everlasting flowers of various shades. Sow in a good heat in pots or boxes of light soil; prick off and pot when large enough. Grow on in gentle heat, such as a frame, and remove to the greenhouse when coming into bloom. Equal parts of loam, peat, and leaf-mould, with plenty of sand, will grow them well.

Gloxinias.—These are splendid plants, and very easy to grow if you can afford them a little heat. They are not subject to the attacks of insects, unless in an unhealthy state, and if not overwatered they seldom become so. But a gentle heat, at least to start them, is necessary; and, except when in flower in July and August, they will not do so well in an ordinary greenhouse as they would in one that was kept more warm and close, or in a frame or pit with gentle heat, which last, as they do not grow to any height, is an admirable place in which to grow them.

Bulbs or tubers may be purchased and started into growth in a heat of 70° to 75° at any time in spring, or a batch of plants may be raised from seed. To flower the same season, sow the seed early in March in a temperature of 65° to 70° . Fill two or more 5-in. pots (with the rims ground level) half full of broken crocks, using leaf-mould, peat, and sand in equal parts, with a little loam beneath the surface. Press the lower part firmly, and put a thin layer of leaf-mould and sand in equal parts, and finely sifted on the top, so that the level of the soil may be $\frac{1}{2}$ in. to $\frac{3}{4}$ in. below the rim of the pot. Make the surface very fine and even, and do not have it wet; let the moisture be down below. Sow the seed, which is extremely small, evenly and carefully, give a dusting of fine silver sand, and cover each pot closely with a square of glass. Place in a sweet hotbed or warm house of the temperature named; keep close and shaded from sun.

When well up give a little air, and when large enough to handle prick off into flat boxes, about 2 in. apart, using the same soil as for sowing. Keep these close in a warm frame, and still shaded. About June pot off singly in 3-in. pots, or earlier if ready, and grow on in a moist temperature of 70° to 80° , only giving air from about nine till four. Keep a moist

atmosphere about the plants, but the soil should be only moist until they are strong and well established: do not wet the leaves often. When the flower buds show give a little manure water; most of them will flower in August, and perhaps a few in July. If you can keep them in a little heat, say not below 60° , rising to 70° or 75° , they will continue to bloom nearly up to Christmas. When the flowering is over withhold water gradually, and expose to more air and sun, and when the tops die down store away, in a temperature not less than 45° or 50° , in their pots, as for Begonias. A kitchen cupboard is a good place.

In spring, as early as you have convenience to do so, bring them into heat to start; then re-pot into 3-in. pots in light rich soil, shaking away all the old soil from the roots. Two parts peat, one of leaf-soil, one loam, and one sand, or any light fibrous compost of that sort, will grow them well. Give good drainage and very little water till they have made a good start. It is just as well to re-pot before they start into growth. When the small pots are full of roots, shift into 5-in. or 6-in. pots, and grow them on quickly in shade and plenty of warmth, and they will be fine plants, with thirty or more flowers on each the second year. The bulbs keep on increasing in size as they grow older, but after four or five years they often get weak and blind, so that it is better always to keep a young stock coming on. Named kinds or any good flower that it may be desired to keep may be propagated by taking off nice healthy leaves with 1 in. of stem about June or July, and inserting them in light, very sandy soil in a well-drained pot, and placing in a close frame with bottom heat of 70° or 75° , keeping shaded. They will strike more easily in cocoa-nut fibre and sand than anything else; indeed, we have had little tiny seedlings that have damped off and been thrown away, fall on to this material, root, and make good plants. By the autumn bulbs will have formed at the base of each leaf, and these may be kept through the winter, and potted and flowered next year. If the leaves are very large, make three or four cuts through the midrib, and peg down to the surface of sandy soil in pans or wide pots, just covering with moss, and a bulb will form at each cut.

It is very important, especially in town, where all kinds of plants do not appear to be able to stand so much sunshine as in the country, that these plants should be shaded from *anything like hot or continuous sun*, especially in their earlier stages, and after a period of dull weather, when they are more susceptible. Yet they should always be kept within 1 ft. or

less of the glass, and no shading be used except when needed, or the flower will be drawn, weak, and flabby, so that a light calico blind is about the best protector, and it should be so arranged as to be easily drawn up or removed when not required. When the flowers are over give the plants all the sun, heat, and air you can to ripen the bulbs and enable them to stand the winter safely and make a good start in spring. When in bloom they may be removed to a greenhouse, conservatory, window, or sitting-room, and the flowers will last a long time.

Hydrangeas are useful. Cuttings struck in the spring or summer of one year, potted and kept slowly growing through the winter in the greenhouse, will bloom the next summer. Keep rather dry through the winter, and pot in sandy fibrous loam, with a little peat and leaf mould.

Ipomœas.—These are lovely climbing annuals of the Convolvulus family. They are all rather delicate in constitution, and require care and to be kept clean. The blooms of some are past description. *I. rubro-coerulea*, lovely sky-blue blossoms; *I. limbata elegantissima*, purple with white edges; *I. hederacea superba*, blue and white; and *I. hed. sup. alba*, white, are specially recommended. *I. Leari* is very fine, but does not seem to do as well in town air as the others.

They should be sown in gentle heat in April or May, using leaf-mould or sand, or some light rich soil. Be careful in watering until the seeds are up, as they are apt to decay in the ground if too wet. When the first rough leaf is formed, they should be potted off singly in 3-in pots, using the same soil, and be placed in a frame with gentle bottom heat till rooted out. Then harden off and plant out in borders, boxes, or large pots in conservatory, greenhouse, or stove, in which they do well. A light soil of peat, leaf-mould, and loam, with plenty of sand, we find suits them best. They may be pricked out into their places straight from the seed-pots, and, if carefully done, they will take no harm if pretty strong. Keep them from green-fly, and water moderately, but not too much. All should have plenty of light, and room to grow in, as some will run nearly or quite 20 feet. Train upon wires, or strings; a dead tree, such as a young Spruce, suits them admirably, or a few nice tall Pea-sticks.

Liliums are grand things for the conservatory or greenhouse, and universal favourites. Immense numbers of *L. speciosum* or *lancifolium* are now grown for market. Pot as directed on p. 130, and place in a cold pit or frame, giving

little or no water until growth has fairly commenced, and the stems are some inches high. Earth up as they proceed, and grow as near to the glass as possible, giving manure water when the pots are full of roots. In spring the pots may be plunged out of doors till the blooms appear, when they should be removed under glass, so as to induce the flowers to open well and clean; but in town we should prefer to keep them in a light and airy house or pit, if they can be properly attended to. *L. auratum*, *candidum*, *eximium*, *longiflorum*, *speciosum*, and *undulatum* are the best for pot culture.

Lobelias.—These are very useful for hanging pots and baskets; any good soil will suit them, such as good loam, with half the quantity of leaf-mould and some sand. If you want them to droop do not pot too firmly. We have found Blue King as good, or better, than any; it is of a good colour, and free in growth and flower, but not straggling; but if you want a compact tuft, use one of the dwarf, or *pumila*, varieties. Give plenty of air, sun, and water to do well. The herbaceous varieties, of which *L. cardinalis*, with tall spikes of bright crimson-scarlet flowers, is the type, may be grown in pots in a cool greenhouse. These are very useful for outside beds in summer, but should be protected in winter. Take up the roots whole, and pot in 5-in. or 6-in. pots, keeping in a cool greenhouse or frame till they begin to grow in spring, then divide and pot each shoot separately, and either harden off and plant out in May, or shift on into larger pots for the greenhouse.

Musk.—A close house will suit this better than an airy one. Harrison's Musk is very handsome and useful, and requires the same treatment as the common Musk. Plenty of water is the golden rule for all these.

Myrtles are very ornamental and useful, especially the broad-leaved kind, for cutting. Treat as directed for window culture. When plants get too large they may be hardened, cut back, kept close, re-potted when broken, and started again, like most hard-wooded things; but we prefer young plants, as being more handsome and useful, and it is no trouble to strike cuttings.

Nicotianas.—Many of the Tobacco plants are suitable; they are generally grown for their foliage, but some have handsome flowers. Most are half-hardy annuals, and should therefore be sown in light soil and gentle heat in spring, grown on, and, if desired, be planted in rich soil out of doors; or may be kept in pots, where, if carefully attended to with water, and kept clean, they make very handsome subjects.

Good kinds are *atropurpurea grandiflora*, *macrophylla gigantea*, and *vuelta*.

But by far the most desirable of these are, in our opinion, the comparatively new *N. longiflora* and *affinis*. These are perennials, or nearly so, almost perpetual bloomers, and may be sown at any time, preferably, however, in spring or autumn. The former has white flowers, and, though not powerfully scented, diffuses a delightful fragrance through the house in which it is grown. The latter variety has also white flowers, but the scent of these is almost beyond description, combining that of the Tuberose and Gardenia. It is very easily grown, and a splendid thing in all respects. Treat much like petunias; the seed germinates readily in a gentle heat, or under a glass; pot off and grow in light rich soil, such as two parts loam, and one each of peat and leaf-soil. Keep well watered and close to the glass.

Passiflora (Passion-flower).—The ordinary *Passiflora corulea* is a capital climber for the town greenhouse; it will not do much good out of doors, but succeeds admirably under glass. Plant out in a border, or large box, of light rich soil, such as two parts loam, one each of peat and leaf-soil, with plenty of sand and good drainage. Take as many main shoots as you require, and train them out carefully 1 ft. or so apart. Any number may be produced by stopping, and if too many thin out the weakest. Let the main shoots or rods grow as far as they will, or are required, and only shorten back to the sound wood in spring, as it often happens that the tender points die back for some distance in winter. In spring a side shoot will be produced at the axil of nearly every leaf. Allow these to hang down naturally; these should show flower in July, but if they do not do so at 12 in. or 18 in. long pick out the points. In the autumn, when the flowering is past, cut these side-shoots back to 6 in. or 8 in. long, and in spring shorten to 2 in., so that a fresh lot may be formed. When one of the rods gets old and worn out, cut it right away and induce a fresh one from the base to take its place. Keep rather dry in winter, but give plenty of water and liquid manure when in full growth. Top dress with 2 in. or 3 in. of fresh rich soil every spring if in a border, but if in a box take away all the surface soil you can get without injuring the roots, and replace with rotten manure. Frequent waterings will wash the richness of this down to the roots. Most of the other kinds of Passion-flower enumerated in catalogues as suitable for the greenhouse will not do much good, but in a nice warm house in a

comparatively favourable situation, a vigorous kind, such as *P. Comte Nesselrode* or *Impératrice Eugénie*, might be made to succeed. We had once a plant of *Tacsonia Von Volkemi*, the scarlet Passion-flower, growing and doing well in a London greenhouse; we had to leave before it was old enough and sufficiently established to show what it would do in the way of flowering, but we fancy it would be worth a trial.

The Orange (Citrus).—Afford an airy and somewhat shady place in the greenhouse. Soil, two parts sandy loam, one each peat and leaf-soil, with plenty of sand and good drainage. Never water until dry, then soak thoroughly. Encourage a good growth in spring by frequent syringings and a warm and humid atmosphere, and when growth is complete, inure to plenty of air and sun, and keep dryish through the winter.

Palms.—These are now general favourites, and the graceful feathery foliage of many imparts a charming appearance to the greenhouse or conservatory. Some of the species, too, are of a moderate habit of growth, and many of the larger ones take a number of years to attain anything like an awkward size, so that, especially in a young state, they are very suitable for anything but a very small house. Many kinds do very well in the cool atmosphere of the greenhouse. A few suitable ones are:—

<i>Areca Baueri</i>	<i>Sabal Adamsonii</i>
„ <i>sapida</i>	<i>Chamærops Fortunei (excelsa)</i>
<i>Corypha australis</i>	„ <i>humilis</i>
<i>Jubea spectabilis</i>	<i>Rhapis flabelliformis</i>
<i>Phoenix dactylifera</i> (Date Palm)	<i>Seaforthia elegans</i>

Cocos Weddelliana is a most lovely thing among Palms and of a nice dwarf habit, but it will not do much good in a cool greenhouse; it needs a warm house or stove. Palms are extremely useful as table plants, or for indoor decoration of any kind, as they will stand the dry air of a house, and even the fumes of gas, better than almost any other plants, but where used for such a purpose, the growth of the season must be completed, or the young and tender leaves will suffer. Re-pot early in March, giving only a slightly larger pot; shake away all loose soil, and re-pot firmly in three parts fibrous peat, one part loam, one leaf-mould or very rotten manure, with plenty of sand and a little powdered charcoal. Drain well. Induce a free growth in spring and summer by plentiful waterings at the root and frequent syringing overhead; also by affording as close and warm an

atmosphere as you can manage consistent with the health of the other inmates of the house. If you have a warm house in which to forward the growth of Camellias, Azaleas, Gloxinias, or the like, by all means remove there after re-potting. When the growth is made expose more, and harden off for decoration in any situation. By the use of manure water, regularly applied, large plants may be had in comparatively small pots. Keep always moist, but much drier in winter than in summer.

Pelargoniums.—These succeed almost better than anything, and hardly any one would believe what splendid plants and blooms can be produced in the most unlikely localities. Three parts loam, one each of very old rotten manure and leaf-mould, with plenty of silver sand and a little charcoal, is about the best stuff to give them when in flowering pots. Some of the delicate-growing kinds should have peat substituted for the manure. Road scrapings (from the country, not town), and the sand that is washed to the sides of a gravelled road by rain are very useful for these. If it can be had, we recommend fine burnt ballast, passed through a $\frac{1}{4}$ -in. sieve, or the fine portions washed to the side of a ballasted road or path by rain, to much silver sand. This keeps the soil open much better than any amount of fine sand, and being of a gritty nature, and yet affording a considerable amount of nourishment as well, the roots seem to revel in it; ballast, moderately fine, makes splendid drainage for these or any other plants.

The secret of fine and plentiful heads of bloom is inducing the plants to make a long, strong, and healthy growth for months before they bloom. It is of importance, especially in town, to get the cuttings in early and have them well rooted and potted off in good time—the end of September or earlier. Cuttings should be taken in July or August; choose strong points that have not bloomed; the stronger the cuttings are the finer the plants will be. They should have been well hardened—that is, the plants from which they are taken—and yet should be in a growing state. Put them in singly in $2\frac{1}{2}$ -in. pots or three or four round the sides of 3-in. pots, like Geraniums, but use a lighter and more open soil. Use fresh cinders for drainage, and the cuttings will strike as well in simple coal ashes, sifted fine, as in anything, but if these are used, pot the plants in earth as soon as rooted, or they will get starved. These do not strike so freely as Geraniums (zonals); the pots of cuttings must be put in a frame and kept close, or if they have a spent hot-bed they will do better in that, and if the pots can be plunged all the better.

As soon as struck give air, and pot off singly—that is, if there are more than one in a pot, as soon as the roots are 1 in. long, and keep close again till rooted out. Be careful not to break the young roots in potting, as they are very brittle. Use at this stage about equal parts of loam and leaf-mould, with plenty of sand and a part of road-drift, if you can get it. Pot into 3-in. pots. In these, unless struck very early, they remain till the new year, and then or soon after they are ready—that is, the pots well filled with roots—shift into 5-in. pots. To do their best the plants should have a place in a light airy greenhouse where there is a temperature of not less than 45° at any time, rising to 50° or 55° by day and a somewhat dry atmosphere. It is of the greatest importance that they should be on a shelf close to the glass, and that plenty of air should be admitted whenever possible, so that the growth made may be firm and robust, not drawn and weak as it will be in a close house. The air, though dryish, should not be at all parching, and water must only be given when required; too much moisture is very injurious to Pelargoniums during the dull season of the year.

Pinch out the points of the shoot (for there should be only one to begin with) as soon as the plants are fairly established and making growth, and repeat the process when necessary as soon as the fresh shoots have made three or four joints. If the plants are to bloom in 5-in. pots, three or four, or five shoots at most, will be sufficient; if in 7-in. or 8-in. pots, have more. But except for exhibition, or when large specimens are wanted, the smaller plants are preferable in many ways, and a 5-in. pot will carry a tremendous head of bloom, if well grown. Thin out the weakest shoots, if there are more than are wanted. When they begin to grow freely, the stems must be tied out from one another, in order to admit plenty of air and light between them. The shoots should all be neatly trained equidistantly.

When shifted into the 5-in. pots in January or February, keep drier for a time, till the roots are working freely in the fresh soil. Still keep close to the glass, with plenty of light and air, and clean from insects. Attend to the training and tying of the shoots, and when the flowering pots are well filled with roots, give a little weak manure water occasionally, increasing the frequency and strength of the application as the bloom buds appear. Any showing too soon should be pinched out. If the plants are to be shifted again, stop the shoots some time before doing so, keeping dry and not

re-potting till well broken again. Never stop after they are placed in the flowering-pots, but let them run up as tall and strong as they like. As the spring advances give all the air and sun possible, and a solution of sulphate of ammonia, in the proportion of $\frac{1}{2}$ oz. to the gallon, is beneficial at alternate waterings. Tie up to stakes as they advance, and give plenty of water when coming into flower and the weather is warm—these soon get dry when the sun shines strong.

If the above directions are carefully and systematically carried out, you will have plentiful heads of fine bloom, with ten or twelve flowers to a truss, in June or July, as we have frequently had. When the flowering is over, stand the plants out of doors in a sunny place, and give very little water for two or three weeks, then cut down closely, put in the shoots for cuttings, and place the old plants in a close warm house or frame till well started, and when the young shoots are 1 in. or $1\frac{1}{2}$ in. long, re-pot into 3-in. or as small pots as the roots will go; keep close for a little time, then give plenty of air and shift on as required for next year. These old plants will bloom earlier than the young cuttings. Cuttings may be struck in heat in spring to produce plants for autumn blooming, but we prefer the autumn-struck ones.

Petunias, both single and double, are grand things for the greenhouse in summer. Full instructions for raising plants either from seeds or cuttings have already been given. Good kinds, especially doubles, are better propagated from cuttings taken in spring—they strike freely in a gentle heat. But a batch of seedlings from a good strain, such as Hender's, will give dozens of fine plants, though some of course will turn out worthless. Sow and treat as directed, and prick off and pot into 3-in. pots when ready. Shift into 5-in. or 6-in. pots when the others are full of roots, stake and train as they grow, and remove to the greenhouse to flower, giving manure-water occasionally. Cut them down when they get too tall, and strike a few of the young shoots in August or September to make sure of keeping a stock through the winter, as the old plants are not always to be depended upon.

Phlox Drummondii makes splendid pots for the conservatory or greenhouse. The cultivation of nearly all kinds of half-hardy annuals as pot plants is very similar. Sow the seed in March in gentle heat, or in April in the greenhouse or cold frame. Sow either in boxes to prick out into the pots, or in 3-in. pots, putting five or six seeds in each, and rather near the edges than in the centre. In either case

give good drainage, and a soil of equal parts of loam, leaf-mould, and sand, or less of the latter, or any light and rich soil. It should be pretty fine, and made moderately firm. Cover very slightly and place in a close frame, with or without gentle heat as above. As soon as well up give air, and when strong enough prick off three or four equal sized plants into 5-in. or 6-in. pots, putting them at equal distances and near the edge, from the boxes; or if sown in the pots, merely thin out to three or four of the best at equal distances and near the sides as before. When well advanced these must be shifted whole into 5-in. or 6-in. pots, using a good soil of three parts loam, one each well-rotted manure and leaf-soil, and little or no sand. Pot firmly, with moderate drainage. Both for this and the other mode, when the plants are in blooming pots, they should be plunged in a frame, with the plants within 6 in. of the glass, and abundance of air on all favourable occasions; if there is a gentle bottom heat, at least in the earlier stages, all the better. Keep the glass clean, and do not shade except from scorching sun after a dull day or two, then only slightly. Give plenty of water, but do not let the soil get sodden, only water when needed. Manure water may be applied when the pots are full of roots. Stake as required, using slight sticks, and tying neatly but not tight. When in flower remove to the conservatory or sitting-room.

Plumbago capensis.—Treat the same in the greenhouse as in the window, employing it either as a pot, pillar, or wall plant. If required to cover any considerable extent of wall or other surface, do not prune so closely as directed for pots, merely shorten back the shoots. Manure water may be given to pot plants with advantage when in full growth and coming into flower. The colour of the flowers of this elegant plant is quite distinct from that of any other flower. *P. rosea* has pink or rose-coloured blooms, culture similar, but it is rather more delicate.

Primula sinensis (Chinese Primrose).—This is certainly the freest blooming winter flower we possess, in fact, plants will often literally bloom themselves to death if allowed to perfect all the trusses produced. In a town greenhouse, where you can hardly induce a blossom of anything else to open in December and January, these, with ordinary care, will be a perfect mass of bloom, so that a few good plants will keep the place gay through all the dull days. There are now so many colours that quite a varied show can be made. Of the single kinds, the pure white, rose colour, magenta,

or carmine; Vesuvius, which is almost a true scarlet, and Ruby King, a deep blood-red or crimson, are especially fine. The striped and spotted flowers are more curious than beautiful, at least in our opinion, but they afford a variety. The double ones, especially the double white, are very effective and good for cutting, as the flowers do not fall like the single ones, but the individual pips are not so large. But though such free bloomers, many people fail in growing Primulas successfully, so we will, before showing how to raise the plants, give a few hints on the conditions in which the plants succeed best.

In the first place, they must have been previously well grown, as no one can get good flowers from a bad strain, or from plants that were sown too late, or drawn up weak and spindly in a close frame, or that have been grown in too much shade or heat. To make good flowering plants by October or November, the seed should have been sown in March, and by the time they are wanted in flower the plants should be strongly established in 5-in. pots, with these full of roots and a profusion of healthy foliage. They must be flowered, to do well, in a light, airy house, and kept pretty close to the glass; to flower freely they need a warmth of 45° by night, or certainly never less than 40° on the coldest nights, and only that very seldom, rising to 50° by day, or 55° or 60° with sun heat.

The atmosphere must be moist, but not too much so, or damping may occur; but a dry parching air is very detrimental, so that they should not be placed on narrow shelves directly over hot-water pipes or flues. The best position is standing on, or partly plunged in, moss or cocoa-fibre on a wide flat shelf or stage, away from all heating mediums. Air should be admitted on all favourable occasions, but avoid draughts.

Many complain that Primulas are so apt to damp off at the collar, and so they are under unfavourable circumstances. When grown in a house with proper heating apparatus this should never occur, as by keeping the atmosphere in a constantly moving state by the judicious application of heat in the pipes, &c., a state of what is termed buoyancy is created which will effectually prevent all damping.

Watering is a point to which great attention must be paid, as these plants are apt to damp off at the collar, if even slightly overwatered, and yet sufficient must be given to supply all needs. It is a good plan to put a little silver sand round the collar of each plant, or surface the pots with

small lumps of charcoal or freestone. Water with soft tepid water in the morning about ten or eleven o'clock, especially if the sun shines, or promises to do so, for water is not needed every day, and never give any at all until the soil is nearly dry. Weak manure water may be given twice a-week when in flower; this helps them greatly. Of course, if in a cool house not so much water must be given as in a warm one. Primulas will never do well in a cold, damp, or shady house; they must have air, light, and warmth.

We always prefer to treat them as annuals, young plants in 5-in. pots, with a single crown, looking much better in our opinion than any others. Old plants kept through the summer in an open, airy frame, and, repotted into 6-in. or 7-in. pots, often flower more freely, but they are apt to get very straggling. Where only a few plants are required, we should advise country-grown ones being purchased from a nursery in the autumn. But a batch of seedlings may be successfully raised in any town with care, and though you cannot get the foliage quite so fine and healthy as market plants have, yet they will flower as finely and well as any.

Sow the seed in March or April, or not later than May. The secret of growing Primulas well is to give them in all stages an open, porous, granular, and yet rich soil, through which the water will readily percolate, so that a free supply may be given without any chance of the soil becoming sodden. So prepare a pan or box with plenty of drainage, and some moss or spent heps over that, and fill up to within 1 in. of the rim with the following compost: leaf-mould, from which the very fine dust has been sifted, using only the rougher portions, but picking out all bits of stick or bark, lumps, &c., two parts sandy peat, one part good fibrous loam, rather lumpy, one part of what is known as "ballast," or crocks broken so small as to pass through a $\frac{1}{2}$ -in. sieve, or very coarse sand, and one part silver sand. Mix well, but do not make too fine. Press only slightly, as Primulas always prefer a somewhat loose soil; yet the lower part must be firmish and well watered. Scatter a little fine soil, such as sifted leaf-mould and sand in equal parts, on the surface, sprinkle lightly with warm water; then sow the seed evenly and thinly, give a very light dusting of the fine soil, and cover the pan or box with a sheet of glass; this may be whitewashed on the outside. Place in a gentle hotbed of about 70° , or in a warm house or stove. If you have no heat, do not sow till the end of May. Avoid watering until the plants are up, and when they appear give a little air. If

the surface of the soil gets caked, prick it up between the plants with a pointed piece of stick, and dust with dry silver sand. Keep near the glass, and shade from bright sun. If thick in the box, thin out carefully, and prick out the thinnings into other boxes $2\frac{1}{2}$ in. or 3 in. apart, or pot singly into small 3-in. pots, using the same soil and good drainage.

Always keep both the soil and air moist, but not wet. Have all potted off in June or July, and place them in a gentle hotbed, plunging the pots in hops or fibre. Remember in potting only to press the soil very gently down, and not to make it hard; also to use it in rather a rough state. Keep close for a while after potting, and shade from bright sunshine. Admit air carefully until the plants are strong, and shut up close when cold or stormy. In July or August, or even September, when the pots are pretty full of roots and the plants strong, shift into 5-in. pots, using two parts rich, rather rough, fibrous loam, one part each of peat and leaf-mould, and some finely crushed crocks or bricks and silver-sand; a little fine ballast keeps the soil open better than anything. Afford good drainage, and pot rather deep, so that the plants may not shake about; put a little sand round the neck to prevent damping. Return to the frame, and keep plunged and close to the glass. Keep close for a few days, then accustom to plenty of air and all but very strong or scorching sun. If there is a gentle hotbed in the frame all the better, as though in the country they will do well without, yet the stimulus to growth is beneficial. Give air on warm nights in August as well as by day, and on fine mornings and evenings draw the lights off for an hour. Keep all flower buds picked off as they show till wanted in bloom.

Primulas may be propagated by cuttings, especially the double varieties, which are generally grown in this way. After flowering put some sand round the base of the shoots, and harden as much as possible. Put the cuttings singly into $2\frac{1}{2}$ -in. pots, or two or three in a 3-in. pot in very sandy soil, the pots to be half full of drainage. Tie each to a small stick to keep them steady. Plunge in a gentle heat in a frame and keep close, only giving a little air in the morning. When rooted give air, and pot off singly. The double kinds may be raised either from seed in the same manner as the single ones, or from cuttings as above. They are more delicate than the single ones, and require to be very carefully potted in a soil of equal parts of loam, leaf-mould, peat, and sand, and be kept in a rather closer and more general shade.

sphere than is needed for the others. Keep in a warm house near the glass in winter, and thin out the trusses of buds, as they cannot perfect them all.

Salpiglossis.—This is a very pretty annual for pots. Sow in light rich soil in pots or boxes in a gentle heat in April, and prick off into 5-in. or 6-in. pots, using light, rich soil, and putting three, four, or five plants in each pot. Keep plunged in a frame with gentle bottom heat, and plenty of air and sun as the plants advance. These need more heat than *Phlox Drummondii*. Give manure water when the pots fill with roots, and remove to the greenhouse when in flower, or when too tall for the frame.

Schizanthus of sorts, especially *papilionaceus*, are pretty. Treat the same as the last, but this being more vigorous in growth, does not need so much warmth.

Solanum jasminoides and *jasminiflorum*.—These are both very similar, the only difference being that the former has pale purple, and the latter white flowers, which are produced in bunches. Both are scandent shrubs, or climbers, (perennial), and are, especially the latter, great favourites in greenhouses. Treat much the same, as to soil, &c., as the *Plumbago*; but these are better planted out in a border or large box. They need but little pruning; only keep the strong shoots stopped, so as to cover the wall with verdure. Water plentifully when in growth, and keep dryish through the winter. Cuttings of young side-shoots taken off in June, and inserted in sandy soil in bottom heat in a close frame or under a bell-glass, strike readily.

Spiraea japonica.—Always plant out of doors as soon as flowering is over and the plants have been hardened a little. Take up and pot in October, or any time when required. Give plenty of water and light when in growth. Seedlings make good plants, and are useful where a number are required.

Thunbergias.—Fine annual climbers, with flowers of various shades of yellow and white, and some have black eyes. The flowers are produced in the greatest profusion. No insects or diseases attack these plants, at least in our experience, and they are very vigorous in growth, and stand drought well. Sow in light soil in a good heat in April, harden a little, and pot off singly into 3-in. pots. Plant out in borders, boxes, or large pots in the greenhouse or conservatory. Give plenty of water when in growth, and arrange sticks, wires, or strings for them to cling to. They only climb about 4 ft. These never look better than when allowed

to climb naturally about a straight branch of a tree with plenty of twigs, or a few nice pea-sticks stuck in the pot when grown in one.

Vallota (amaryllis) purpurea, the Scarborough Lily, is a grand autumn flowering bulb, indispensable where a continuous display is required. For soil, &c., see page 112. Keep slowly growing through the summer in a warm and sunny greenhouse, with abundance of air and plenty of water. If the flower spike does not appear by the end of August, keep rather dry, which will generally induce flowering.

The Vine.—The Grape Vine makes, when properly cultivated, the best of all climbers under glass, for what flowers can surpass the beauty of the hanging bunches of ripening grapes? and then when you have gratified your eyes by looking at them, you can gratify your palate by eating them afterwards. Fine fruit can be grown and ripened well in a greenhouse in any town. For ordinary culture in a cool greenhouse nothing can surpass the Black Hamburg, but Black Prince, Foster's White Seedling, and Buckland's Sweetwater, or an Early Frontignan, will all do well.

The vine should have a sunny greenhouse, or the fruit will not ripen; and the nearer the house, if a lean-to, faces south, and the greater the duration of sunshine it is open to receive, the better the results will be.

Borders and Planting.—If possible the cane or canes should be planted in a border inside the house; this need not be wide, but the front or side of the house should be built upon pillars, so as to admit of the roots extending into another border outside. But if this plan is not admissible a hole may be made in the side or wall for each plant, and the young cane, being passed through this, should be planted in a border outside. The best season to plant is in the spring, when the young shoots are 1 in. or 2 in. in length, if planted inside, or in May if outside. The Vine will do far better if a properly prepared bed or border is provided, as one cannot depend upon the natural soil, especially in a town. This should be somewhat raised above the ordinary ground level, so as to be warm and dry, and as it should be about 3 ft. deep altogether, 18 in. in and 18 in. above the ground will be suitable. Take out the soil 18 in. or 2 ft. deep, making the border as wide, up to 8 ft. or 10 ft., as you can, though less will do, and as long as convenient. Make the bottom hard and sloping from each side down to a drain along the centre. This may be done either by ramming in stones or by forming a concrete bottom. Place 9 in. or 10 in.

of coarse rubble or broken bricks over the bottom, then a layer of turf sods turned upside down, and fill up with nice turf loam, chopped up pretty small, mixed with about one-sixth of decayed horse or cow dung, add also a still smaller portion of old mortar rubbish, crushed charcoal, and broken sandstone or bricks, in equal parts, and a little soot and crushed bones may be advantageously used as well. Tread this mixture in firmly, and make it 6 in. or 8 in. higher than the desired level, as it will be sure to sink. Plant the cane on a slightly raised hillock, and have that part of the bed rather the highest, and sloping gently down to the sides all round.

Although it is much better to make a proper border, as described, yet if the soil is fairly good and drained, much trouble may be saved by merely planting in the ordinary soil, the bed being well dug and thrown up a little higher than the ordinary level. We have known many Vines do very well thus; but in no case dig in a lot of manure, if this is needed at all, it should be applied on the surface, after the vine has become well rooted in the ground.

Watering and Mulching.—Plenty of water must be afforded when the Vine is in active growth, but keep rather dry in winter. Never water the soil, especially in the case of inside borders, in driplets, but when necessary give a thorough soaking, enough to reach every fibre to the very bottom of the bed, and then leave alone till needed. Three or four of these soakings is generally sufficient in the course of a season. Use warm or tepid water, for inside borders especially. In September put 1 ft. or 18 in. of dry litter or fern over the outside border, and have a tarpaulin or other waterproof covering at hand to spread over this in wet or snowy weather to keep it dry. The stem when it enters the house must be well wrapped up with haybands, and plenty of nice dry litter heaped up round it, especially if the inside of the house is at all warm. If much fire heat is used, and the Vine started into growth while the weather outside is cold and frosty, then more must be done. Take off the litter when the buds inside begin to swell, and lay 1 ft. or 2 ft. of nice hot stable manure or other fermenting material all over the border outside, covering again with the litter. This will stimulate the roots, and balance the excitement both at branch and root.

Training, &c.—The main principles of training and culture of the Vine are as follows: obtain, by stopping or thinning, or both, the requisite number of main shoots or rods, and

carry them right up the roof or rafters. There should not be more than three or four of these to each plant, two will do, and, as they should not be nearer than about 18 in. from each other, a good distance for the Vines or canes to be planted apart, when a number are grown, is 4 ft. or 4 ft. 6 in. When you have got the requisite number of shoots started, let them grow without stopping as far as they will, and, when the leaves fall in the autumn, cut them back to about 2 ft. from where they started. In the spring a side shoot will spring from the axil of each leaf along these shoots. These side shoots produce the fruit, but there will not be any for two or three years probably. When three full-sized leaves are formed upon each of these, take out the points beyond the third leaf. Do not stop the one at the last joint—the one nearest the point—but let it grow as far as it can or will. In the autumn cut this back to 2 ft. or 3 ft. long, and prune all the side shoots back to three eyes, or two strong ones, of the main rod. In the spring thin out by taking out with finger and thumb all weak or superfluous shoots, leaving only one strong one at each joint. It is better not to let them fruit, even if they show this year, but stop at the third large leaf, leaving the end one to grow, as before. Thin out the leaves if too thick in early summer and repeat the pruning in autumn. Next spring leave the side shoots until you can see if any fruit, or rather flowers, show, and stop at one joint beyond the fruit-bud. These generally appear at the third or fourth joint. Stop all barren ones as before. Any later or second shoots from the first ones must be rigorously removed. This stopping and pruning must be repeated each year, and when a rod gets worn out, as it will after a few years of bearing, cut it right out, and induce a fresh one to start from the base. Renew them thus alternately, and not all at once, or more than one each year. Considerable experience is necessary to perform these operations of pruning and thinning, &c., properly, and a volume might be written on the subject, but we can only give general rules and principles, and after all experience is the best teacher.

Ventilating, Temperature, &c.—When the Vines begin to break into growth in spring, abundant moisture should be kept up in the atmosphere of the house by syringing, and this should be kept up till the flowering commences, so as to induce the Vines to break strongly into leaf. Not nearly such frequent syringings are needed in a house filled with plants in pots as in a regular Vinery, as the amount of

foliage keeps the air constantly humid. Keep the house a little close, and as warm as you can, while breaking, as well. When the flowers are opening, keep drier, and give the canes a smart rap with the hand at mid-day, when the sun shines, to distribute the pollen. When the fruit is set, give more moisture, and attention must now be paid to thinning the bunches and leaves, if either are too thick, and to removing all second or useless growths. As the berries swell off they must be thinned, so as to have just enough berries left to make a compact bunch, yet leave room for each berry to attain its full size. When the fruit begins to colour, admit more air, and keep drier, to give firmness and flavour. Of course where other plants are grown in the same house these different conditions cannot be so strictly observed as in a Vinery where nothing else is grown, but you must strike the happy medium as nearly as you can. When the fruit is cut and the leaves are fallen, cut back each fruit-bearing shoot to two or three eyes, and keep dryish and safe from frost through the winter. If the Grapes hang late, plenty of air must be given, and a little fire-heat on dull days to dispel damp. Moderate-sized Vines may be grown well in pots, 10 to 12 or more inches in diameter, or in large boxes. They seem rather to like having the roots cramped, but in this case plenty of nourishment by top-dressing with rich soil, manure watering, &c., must be supplied when the fruit is swelling. If it can be afforded them, vines are benefited by a considerable amount of bottom heat.

A CHEAP AND USEFUL HOTBED.

Take a box, such as a stout packing-case, of almos; any size from 18 in. by 12 in., and 9 in. or 10 in. deep; or, if you want a good sized affair make a regular box frame, like a cucumber frame, of any size up to 6 ft. by 4 ft. or so, and it should be 18 in. or 2 ft. deep at the back, and 12 in. or 15 in. in front, or more. We find about 4 ft. by 3 ft. a most useful size. If it is of any considerable dimensions, you must have a properly glazed light or sash for the top, but if small, one or two good sized sheets of stout glass, just to lay on the top, will do. You must have a close board bottom for this, and it is better not to nail this on, but have it rather larger than the frame, and fixed in a suitable place so that this may stand on it, like a box on a raised floor

Cut a round hole, about 3 in. in diameter, in the centre of this bottom.

Now nail strips of wood, about 1 in. thick, all round inside the box or frame, so that the upper edge of the strips may be from 5 in. to 8 in. above the floor or bottom edge, and, if the box is at all large, arrange others pretty deep, so as to be stiff and strong, down the middle or across, or both, in one or more places, with their upper edges level with the others. Get a sheet, or, if large, two or more pieces of galvanized iron or zinc, in stout sheet form, so as to be, when altogether, $1\frac{1}{2}$ in. larger all round than the inside of the frame or box. This $1\frac{1}{2}$ in. must be turned up at right angles all round, so as to nail it to the sides. Get this perforated if you can, if not, punch it full of holes about 3-16ths of an inch in diameter; 1 in. apart will do. Fix this inside, and nail it so as to rest upon the strips of wood. The holes should be punched from the under side, not from above.

The surface of this perforated or false bottom should be at the lowest point at least 4 in. from the upper edge of the frame, if a very small one, and if 5 in. all the better, and increasing up to 6 in. or 8 in., or even 9 in., according to the room required, for a large affair. Now you want a flat tin or galvanized iron vessel, 2 in. or 3 in. deep for a moderate sized frame, and 8 in. to 12 in. square, or any convenient size. We have seen an ordinary baking tin used for a small affair with good results, but for a large frame, 6 ft. by 4 ft. or so, a much larger tank is wanted.

This must be set in the hollow chamber under the false bottom, exactly over the hole mentioned, and it must be raised 2 in. or 3 in. from the floor by pieces of tile or brick placed under the corners. The top of this tank should be from $1\frac{1}{2}$ in. to 3 in. below the false bottom, and you should have a plain flat piece of galvanized iron or tin to place over this when required. There should be a door in the back or side of this lower chamber through which this tin or tank may be filled and attended to. This must be always kept filled with water, or nearly so. The next thing is the lamp. For a small frame, not more than 3 ft. by 2 ft., or 2 ft. 6 in. or so, an ordinary paraffin lamp, such as a small table or kitchen lamp, will do, and the usual glass chimney may be used; but it is better to get one made on purpose, with a metal chimney, and a strong tin holder to contain 1 quart or 2 quarts of oil. If the frame is large, you must have a proportionately larger lamp, with a powerful burner 2 in. or $2\frac{1}{2}$ in. wide, and for a full-sized frame, where a good heat is

required, a duplex burner and very large oil reservoir will be required.

The frame should be elevated on strong legs or posts, or supports of some kind, at such a height that the lamp will go well underneath it. Now put 1 in. or $1\frac{1}{2}$ in. of cocoa-nut fibre refuse evenly over the perforated bottom, fill the tank beneath with water (hot, to save time), light the lamp, and block it up so that the top of the chimney goes an inch or two through the hole in the wooden bottom, and comes within 1 in. or $1\frac{1}{2}$ in. of the bottom of the tank. Be sure that the chimney is fair in the centre of the hole or the wood may get charred. Shut up the frame close, and turn the lamp up to a fair height, and in from four to ten or twelve hours, according to the size of the apparatus, there will be a heat of 70° or 75° , even in early spring. You may now fill the frame with pots and boxes of seeds, cuttings, &c., and all that is needed is to keep the lamp trimmed and supplied with oil, and the pan or tank of water always at least half full. The heat may be regulated by turning the lamp higher or lower. If the chimney is of glass, be careful always to remove it before filling the pan with water, as if a spot falls on it when hot, it will fly in a thousand pieces. A metal one is much better.

The materials to construct the whole affair will not exceed ten to fifteen shillings for a good-sized one, say 4 ft. by 3 ft., and less for a smaller one; whereas if you purchase one of the patent propagators, as they are called, you have to pay at least twice as much. Of course where expense is no object by all means purchase, but with many this is not the case; besides, to a handy amateur the construction of such a thing would be a real pleasure.

Now, the great difficulty is that you cannot put such an affair as this out of doors, at least not unless the lamp, &c., is very carefully boxed up, as the least puff of wind will put it out. The only way is to have a little house made to hold the light. Be careful, in any case, how you open and shut the light of the frame, suddenly lifting or dropping it always puts out the lamp. A small affair may be put in a light window, but the tender seedlings will run towards the light, and get weak and spindly. Under a skylight would be a good place, or fixed in the roof of a shed or outhouse, so that the glazed light would form part of the roof, and the lamp could be got at from underneath. Or it may be arranged as a pit, with brick or wooden sides, and a door underground to get at it, or, indeed, any way or anywhere where the lamp

will keep in, and there is plenty of free and unobstructed light; this is indispensable. A small one may be put altogether inside a greenhouse, and would do well there. Such an arrangement as this, if properly constructed, will be far more useful than an ordinary hotbed formed of fermenting materials, as the heat and moisture is so much better under control. If too much moisture rises through the fibre, place the sheet of tin over the pan of water, this will check the evaporation. The fumes of the lamp seem to be entirely neutralized by passing through the moist fibre, and we have never found even the most delicate plants or seedlings injured in the least.

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